

UNCLASSIFIED

**Department of Defense
Fiscal Year (FY) 2018 Budget Estimates**

May 2017



Missile Defense Agency

Defense-Wide Justification Book Volume 2a of 2

Research, Development, Test & Evaluation, Defense-Wide

UNCLASSIFIED

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Table of Volumes

Defense Advanced Research Projects Agency..... Volume 1

Missile Defense Agency..... Volume 2

Office of the Secretary Of Defense..... Volume 3

Chemical and Biological Defense Program.....Volume 4

Defense Contract Management Agency..... Volume 5

DoD Human Resources Activity..... Volume 5

Defense Information Systems Agency.....Volume 5

Defense Logistics Agency.....Volume 5

Defense Security Cooperation Agency..... Volume 5

Defense Security Service..... Volume 5

Defense Technical Information Center.....Volume 5

Defense Threat Reduction Agency.....Volume 5

The Joint Staff..... Volume 5

United States Special Operations Command..... Volume 5

Washington Headquarters Service..... Volume 5

Operational Test and Evaluation, Defense..... Volume 5

UNCLASSIFIED

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Defense Geospatial Intelligence Agency..... (see NIP and MIP Justification Books)
Defense Intelligence Agency..... (see NIP and MIP Justification Books)
National Security Agency.....(see NIP and MIP Justification Books)

UNCLASSIFIED

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Volume 2a Table of Contents

Introduction and Explanation of Contents.....Volume 2a - v

Comptroller Exhibit R-1..... Volume 2a - vii

Program Element Table of Contents (by Budget Activity then Line Item Number)..... Volume 2a - xxvii

Program Element Table of Contents (Alphabetically by Program Element Title)..... Volume 2a - xxxi

MDA Overview.....Volume 2a - xxxv

MDA Appropriation Summary..... Volume 2a - xlix

MDA Congressional Reporting Requirements..... Volume 2a - liii

MDA Program Assessment Rating Tool.....Volume 2a - lxv

Acronyms..... Volume 2a - lxvii

Exhibit R-2's..... Volume 2a - 1

UNCLASSIFIED

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Introduction & Explanation of Contents

The Department of Defense FY2018 Budget Estimates RDT&E (Includes Procurement, O&M, and MILCON), Defense-wide Volume 2, Missile Defense Agency (MDA) justification materials consists of two books titled Volume 2a and 2b. Justification documents are provided in the books as listed below.

Volume 2a

- R-1 Comptroller Exhibit
- MDA FY 2018 Budget Estimate Overview
- MDA Appropriation Summary
- Acronyms
- RDT&E Exhibits in BA-03, BA-04, and BA-06

Volume 2b

- P-1 Comptroller Exhibit
- MDA Operations and Maintenance Exhibit
- MDA MILCON Exhibits
- MDA Procurement Exhibits

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Department of Defense
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation -----	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Research, Development, Test & Eval, DW	6,210,652	5,892,757	5,969,695				
Total Research, Development, Test & Evaluation	6,210,652	5,892,757	5,969,695				

UNCLASSIFIED

Department of Defense
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Research, Development, Test & Eval, DW	5,892,757	5,969,695		5,969,695	6,200,711		6,200,711
Total Research, Development, Test & Evaluation	5,892,757	5,969,695		5,969,695	6,200,711		6,200,711

UNCLASSIFIED

Department of Defense
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Summary Recap of Budget Activities							
Advanced Technology Development	187,246	200,527	204,827				
Advanced Component Development And Prototypes	5,898,841	5,661,070	5,733,708				
Management Support	124,565	31,160	31,160				
Total Research, Development, Test & Evaluation	6,210,652	5,892,757	5,969,695				
Summary Recap of FYDP Programs							
Intelligence and Communications	941	969	969				
Research and Development	6,173,840	5,860,628	5,937,566				
Administration and Associated Activities	35,871	31,160	31,160				
Space							
Total Research, Development, Test & Evaluation	6,210,652	5,892,757	5,969,695				

UNCLASSIFIED

Department of Defense
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<u>Summary Recap of Budget Activities</u>							
Advanced Technology Development	200,527	204,827		204,827	291,554		291,554
Advanced Component Development And Prototypes	5,661,070	5,733,708		5,733,708	5,879,210		5,879,210
Management Support	31,160	31,160		31,160	29,947		29,947
Total Research, Development, Test & Evaluation	5,892,757	5,969,695		5,969,695	6,200,711		6,200,711
<u>Summary Recap of FYDP Programs</u>							
Intelligence and Communications	969	969		969	986		986
Research and Development	5,860,628	5,937,566		5,937,566	6,117,877		6,117,877
Administration and Associated Activities	31,160	31,160		31,160	29,947		29,947
Space					51,901		51,901
Total Research, Development, Test & Evaluation	5,892,757	5,969,695		5,969,695	6,200,711		6,200,711

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Summary Recap of Budget Activities							
Advanced Technology Development	187,246	200,527	204,827				
Advanced Component Development And Prototypes	5,898,841	5,661,070	5,733,708				
Management Support	124,565	31,160	31,160				
Total Research, Development, Test & Evaluation	6,210,652	5,892,757	5,969,695				
Summary Recap of FYDP Programs							
Intelligence and Communications	941	969	969				
Research and Development	6,173,840	5,860,628	5,937,566				
Administration and Associated Activities	35,871	31,160	31,160				
Space							
Total Research, Development, Test & Evaluation	6,210,652	5,892,757	5,969,695				

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<u>Summary Recap of Budget Activities</u>							
Advanced Technology Development	200,527	204,827		204,827	291,554		291,554
Advanced Component Development And Prototypes	5,661,070	5,733,708		5,733,708	5,879,210		5,879,210
Management Support	31,160	31,160		31,160	29,947		29,947
Total Research, Development, Test & Evaluation	5,892,757	5,969,695		5,969,695	6,200,711		6,200,711
<u>Summary Recap of FYDP Programs</u>							
Intelligence and Communications	969	969		969	986		986
Research and Development	5,860,628	5,937,566		5,937,566	6,117,877		6,117,877
Administration and Associated Activities	31,160	31,160		31,160	29,947		29,947
Space					51,901		51,901
Total Research, Development, Test & Evaluation	5,892,757	5,969,695		5,969,695	6,200,711		6,200,711

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Missile Defense Agency	6,210,652	5,892,757	5,969,695				
Total Research, Development, Test & Evaluation	6,210,652	5,892,757	5,969,695				

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Missile Defense Agency	5,892,757	5,969,695		5,969,695	6,200,711		6,200,711
Total Research, Development, Test & Evaluation	5,892,757	5,969,695		5,969,695	6,200,711		6,200,711

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	St e c
27	0603176C	Advanced Concepts and Performance Assessment	03	11,853	17,880	17,880					U
28	0603177C	Discrimination Sensor Technology	03	27,981							U
29	0603178C	Weapons Technology	03	50,263	71,843	71,843					U
30	0603179C	Advanced C4ISR	03	9,661	3,626	3,626					U
31	0603180C	Advanced Research	03	16,987	23,433	27,733					U
34	0603274C	Special Program - MDA Technology	03	9,650	83,745	83,745					U
40	0603294C	Common Kill Vehicle Technology	03	60,851							U
		Advanced Technology Development		187,246	200,527	204,827					
74	0603881C	Ballistic Missile Defense Terminal Defense Segment	04	197,617	206,834	209,072					U
75	0603882C	Ballistic Missile Defense Midcourse Defense Segment	04	1,260,480	862,080	862,080					U
77	0603884C	Ballistic Missile Defense Sensors	04	233,020	230,077	230,077					U
78	0603890C	BMD Enabling Programs	04	406,326	401,594	408,594					U
79	0603891C	Special Programs - MDA	04	390,264	321,607	323,607					U
80	0603892C	AEGIS BMD	04	804,211	959,066	959,066					U
81	0603893C	Space Tracking & Surveillance System	04	27,262	32,129	32,129					U
82	0603895C	Ballistic Missile Defense System Space Programs	04	21,040	20,690	20,690					U
83	0603896C	Ballistic Missile Defense Command and Control, Battle Management and Communicati	04	425,996	439,617	456,267					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 17, 2017 at 10:40:45

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se c
27	0603176C	Advanced Concepts and Performance Assessment	03	17,880	17,880		17,880	12,996		12,996	U
28	0603177C	Discrimination Sensor Technology	03								U
29	0603178C	Weapons Technology	03	71,843	71,843		71,843	5,495		5,495	U
30	0603179C	Advanced C4ISR	03	3,626	3,626		3,626				U
31	0603180C	Advanced Research	03	23,433	27,733		27,733	20,184		20,184	U
34	0603274C	Special Program - MDA Technology	03	83,745	83,745		83,745				U
40	0603294C	Common Kill Vehicle Technology	03					252,879		252,879	U
	Advanced Technology Development			200,527	204,827		204,827	291,554		291,554	
74	0603881C	Ballistic Missile Defense Terminal Defense Segment	04	206,834	209,072		209,072	230,162		230,162	U
75	0603882C	Ballistic Missile Defense Midcourse Defense Segment	04	862,080	862,080		862,080	828,097		828,097	U
77	0603884C	Ballistic Missile Defense Sensors	04	230,077	230,077		230,077	247,345		247,345	U
78	0603890C	BMD Enabling Programs	04	401,594	408,594		408,594	449,442		449,442	U
79	0603891C	Special Programs - MDA	04	321,607	323,607		323,607	320,190		320,190	U
80	0603892C	AEGIS BMD	04	959,066	959,066		959,066	852,052		852,052	U
81	0603893C	Space Tracking & Surveillance System	04	32,129	32,129		32,129				U
82	0603895C	Ballistic Missile Defense System Space Programs	04	20,690	20,690		20,690				U
83	0603896C	Ballistic Missile Defense Command and Control, Battle Management and Communicati	04	439,617	456,267		456,267	430,115		430,115	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 17, 2017 at 10:40:45

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
84	0603898C	Ballistic Missile Defense Joint Warfighter Support	04	47,566	47,776	47,776					U
85	0603904C	Missile Defense Integration & Operations Center (MDIOC)	04	46,191	54,750	54,750					U
86	0603906C	Regarding Trench	04	8,918	8,785	8,785					U
87	0603907C	Sea Based X-Band Radar (SBX)	04	81,265	68,787	93,287					U
88	0603913C	Israeli Cooperative Programs	04	267,595	103,835	103,835					U
89	0603914C	Ballistic Missile Defense Test	04	290,267	293,441	293,441					U
90	0603915C	Ballistic Missile Defense Targets	04	517,589	563,576	563,576					U
94	0604115C	Technology Maturation Initiatives	04	24,743	90,266	99,366					U
96	0604181C	Hypersonic Defense	04								U
105	0604873C	Long Range Discrimination Radar (LRDR)	04	132,278	162,012	173,162					U
106	0604874C	Improved Homeland Defense Interceptors	04	282,864	274,148	274,148					U
107	0604876C	Ballistic Missile Defense Terminal Defense Segment Test	04	20,980	63,444	63,444					U
108	0604878C	Aegis BMD Test	04	78,468	95,012	95,012					U
109	0604879C	Ballistic Missile Defense Sensor Test	04	83,597	83,250	83,250					U
110	0604880C	Land-Based SM-3 (LBSM3)	04	29,288	43,293	43,293					U
111	0604881C	AEGIS SM-3 Block IIA Co-Development	04	165,456	106,038	106,038					U
112	0604887C	Ballistic Missile Defense Midcourse Segment Test	04	54,619	56,481	56,481					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 17, 2017 at 10:40:45

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	S e c
84	0603898C	Ballistic Missile Defense Joint Warfighter Support	04	47,776	47,776		47,776	48,954		48,954	U
85	0603904C	Missile Defense Integration & Operations Center (MDIOC)	04	54,750	54,750		54,750	53,265		53,265	U
86	0603906C	Regarding Trench	04	8,785	8,785		8,785	9,113		9,113	U
87	0603907C	Sea Based X-Band Radar (SBX)	04	68,787	93,287		93,287	130,695		130,695	U
88	0603913C	Israeli Cooperative Programs	04	103,835	103,835		103,835	105,354		105,354	U
89	0603914C	Ballistic Missile Defense Test	04	293,441	293,441		293,441	305,791		305,791	U
90	0603915C	Ballistic Missile Defense Targets	04	563,576	563,576		563,576	410,425		410,425	U
94	0604115C	Technology Maturation Initiatives	04	90,266	99,366		99,366	128,406		128,406	U
96	0604181C	Hypersonic Defense	04					75,300		75,300	U
105	0604873C	Long Range Discrimination Radar (LRDR)	04	162,012	173,162		173,162	357,659		357,659	U
106	0604874C	Improved Homeland Defense Interceptors	04	274,148	274,148		274,148	465,530		465,530	U
107	0604876C	Ballistic Missile Defense Terminal Defense Segment Test	04	63,444	63,444		63,444	36,239		36,239	U
108	0604878C	Aegis BMD Test	04	95,012	95,012		95,012	134,468		134,468	U
109	0604879C	Ballistic Missile Defense Sensor Test	04	83,250	83,250		83,250	84,239		84,239	U
110	0604880C	Land-Based SM-3 (LBSM3)	04	43,293	43,293		43,293	30,486		30,486	U
111	0604881C	AEGIS SM-3 Block IIA Co-Development	04	106,038	106,038		106,038	9,739		9,739	U
112	0604887C	Ballistic Missile Defense Midcourse Segment Test	04	56,481	56,481		56,481	76,757		76,757	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 17, 2017 at 10:40:45

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
113	0604894C	Multi-Object Kill Vehicle	04		71,513	71,513					U
115	0305103C	Cyber Security Initiative	04	941	969	969					U
116	1206893C	Space Tracking & Surveillance System	04								U
117	1206895C	Ballistic Missile Defense System Space Programs	04								U
		Advanced Component Development And Prototypes		5,898,841	5,661,070	5,733,708					
155	0605502C	Small Business Innovation Research - MDA	06	88,694							U
184	0901598C	Management HQ - MDA	06	35,871	31,160	31,160					U
		Management Support		124,565	31,160	31,160					
Total Research, Development, Test & Eval, DW				6,210,652	5,892,757	5,969,695					

UNCLASSIFIED

Defense-Wide
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Sec
113	0604894C	Multi-Object Kill Vehicle	04	71,513	71,513		71,513	6,500		6,500	U
115	0305103C	Cyber Security Initiative	04	969	969		969	986		986	U
116	1206893C	Space Tracking & Surveillance System	04					34,907		34,907	U
117	1206895C	Ballistic Missile Defense System Space Programs	04					16,994		16,994	U
		Advanced Component Development And Prototypes		5,661,070	5,733,708		5,733,708	5,879,210		5,879,210	
155	0605502C	Small Business Innovation Research - MDA	06								U
184	0901598C	Management HQ - MDA	06	31,160	31,160		31,160	29,947		29,947	U
		Management Support		31,160	31,160		31,160	29,947		29,947	
Total Research, Development, Test & Eval, DW				5,892,757	5,969,695		5,969,695	6,200,711		6,200,711	

UNCLASSIFIED

Missile Defense Agency
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	ec
27	0603176C	Advanced Concepts and Performance Assessment	03	11,853	17,880	17,880					U
28	0603177C	Discrimination Sensor Technology	03	27,981							U
29	0603178C	Weapons Technology	03	50,263	71,843	71,843					U
30	0603179C	Advanced C4ISR	03	9,661	3,626	3,626					U
31	0603180C	Advanced Research	03	16,987	23,433	27,733					U
34	0603274C	Special Program - MDA Technology	03	9,650	83,745	83,745					U
40	0603294C	Common Kill Vehicle Technology	03	60,851							U
		Advanced Technology Development		187,246	200,527	204,827					
74	0603881C	Ballistic Missile Defense Terminal Defense Segment	04	197,617	206,834	209,072					U
75	0603882C	Ballistic Missile Defense Midcourse Defense Segment	04	1,260,480	862,080	862,080					U
77	0603884C	Ballistic Missile Defense Sensors	04	233,020	230,077	230,077					U
78	0603890C	BMD Enabling Programs	04	406,326	401,594	408,594					U
79	0603891C	Special Programs - MDA	04	390,264	321,607	323,607					U
80	0603892C	AEGIS BMD	04	804,211	959,066	959,066					U
81	0603893C	Space Tracking & Surveillance System	04	27,262	32,129	32,129					U
82	0603895C	Ballistic Missile Defense System Space Programs	04	21,040	20,690	20,690					U
83	0603896C	Ballistic Missile Defense Command and Control, Battle Management and Communicati	04	425,996	439,617	456,267					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 17, 2017 at 10:40:45

UNCLASSIFIED

Missile Defense Agency
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Sec
27	0603176C	Advanced Concepts and Performance Assessment	03	17,880	17,880		17,880	12,996		12,996	U
28	0603177C	Discrimination Sensor Technology	03								U
29	0603178C	Weapons Technology	03	71,843	71,843		71,843	5,495		5,495	U
30	0603179C	Advanced C4ISR	03	3,626	3,626		3,626				U
31	0603180C	Advanced Research	03	23,433	27,733		27,733	20,184		20,184	U
34	0603274C	Special Program - MDA Technology	03	83,745	83,745		83,745				U
40	0603294C	Common Kill Vehicle Technology	03					252,879		252,879	U
	Advanced Technology Development			200,527	204,827		204,827	291,554		291,554	
74	0603881C	Ballistic Missile Defense Terminal Defense Segment	04	206,834	209,072		209,072	230,162		230,162	U
75	0603882C	Ballistic Missile Defense Midcourse Defense Segment	04	862,080	862,080		862,080	828,097		828,097	U
77	0603884C	Ballistic Missile Defense Sensors	04	230,077	230,077		230,077	247,345		247,345	U
78	0603890C	BMD Enabling Programs	04	401,594	408,594		408,594	449,442		449,442	U
79	0603891C	Special Programs - MDA	04	321,607	323,607		323,607	320,190		320,190	U
80	0603892C	AEGIS BMD	04	959,066	959,066		959,066	852,052		852,052	U
81	0603893C	Space Tracking & Surveillance System	04	32,129	32,129		32,129				U
82	0603895C	Ballistic Missile Defense System Space Programs	04	20,690	20,690		20,690				U
83	0603896C	Ballistic Missile Defense Command and Control, Battle Management and Communicati	04	439,617	456,267		456,267	430,115		430,115	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 17, 2017 at 10:40:45

UNCLASSIFIED

Missile Defense Agency
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Req e c
84	0603898C	Ballistic Missile Defense Joint Warfighter Support	04	47,566	47,776	47,776					U
85	0603904C	Missile Defense Integration & Operations Center (MDIOC)	04	46,191	54,750	54,750					U
86	0603906C	Regarding Trench	04	8,918	8,785	8,785					U
87	0603907C	Sea Based X-Band Radar (SBX)	04	81,265	68,787	93,287					U
88	0603913C	Israeli Cooperative Programs	04	267,595	103,835	103,835					U
89	0603914C	Ballistic Missile Defense Test	04	290,267	293,441	293,441					U
90	0603915C	Ballistic Missile Defense Targets	04	517,589	563,576	563,576					U
94	0604115C	Technology Maturation Initiatives	04	24,743	90,266	99,366					U
96	0604181C	Hypersonic Defense	04								U
105	0604873C	Long Range Discrimination Radar (LRDR)	04	132,278	162,012	173,162					U
106	0604874C	Improved Homeland Defense Interceptors	04	282,864	274,148	274,148					U
107	0604876C	Ballistic Missile Defense Terminal Defense Segment Test	04	20,980	63,444	63,444					U
108	0604878C	Aegis BMD Test	04	78,468	95,012	95,012					U
109	0604879C	Ballistic Missile Defense Sensor Test	04	83,597	83,250	83,250					U
110	0604880C	Land-Based SM-3 (LBSM3)	04	29,288	43,293	43,293					U
111	0604881C	AEGIS SM-3 Block IIA Co-Development	04	165,456	106,038	106,038					U
112	0604887C	Ballistic Missile Defense Midcourse Segment Test	04	54,619	56,481	56,481					U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 17, 2017 at 10:40:45

UNCLASSIFIED

Missile Defense Agency
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
84	0603898C	Ballistic Missile Defense Joint Warfighter Support	04	47,776	47,776		47,776	48,954		48,954	U
85	0603904C	Missile Defense Integration & Operations Center (MDIOC)	04	54,750	54,750		54,750	53,265		53,265	U
86	0603906C	Regarding Trench	04	8,785	8,785		8,785	9,113		9,113	U
87	0603907C	Sea Based X-Band Radar (SBX)	04	68,787	93,287		93,287	130,695		130,695	U
88	0603913C	Israeli Cooperative Programs	04	103,835	103,835		103,835	105,354		105,354	U
89	0603914C	Ballistic Missile Defense Test	04	293,441	293,441		293,441	305,791		305,791	U
90	0603915C	Ballistic Missile Defense Targets	04	563,576	563,576		563,576	410,425		410,425	U
94	0604115C	Technology Maturation Initiatives	04	90,266	99,366		99,366	128,406		128,406	U
96	0604181C	Hypersonic Defense	04					75,300		75,300	U
105	0604873C	Long Range Discrimination Radar (LRDR)	04	162,012	173,162		173,162	357,659		357,659	U
106	0604874C	Improved Homeland Defense Interceptors	04	274,148	274,148		274,148	465,530		465,530	U
107	0604876C	Ballistic Missile Defense Terminal Defense Segment Test	04	63,444	63,444		63,444	36,239		36,239	U
108	0604878C	Aegis BMD Test	04	95,012	95,012		95,012	134,468		134,468	U
109	0604879C	Ballistic Missile Defense Sensor Test	04	83,250	83,250		83,250	84,239		84,239	U
110	0604880C	Land-Based SM-3 (LBSM3)	04	43,293	43,293		43,293	30,486		30,486	U
111	0604881C	AEgis SM-3 Block IIA Co-Development	04	106,038	106,038		106,038	9,739		9,739	U
112	0604887C	Ballistic Missile Defense Midcourse Segment Test	04	56,481	56,481		56,481	76,757		76,757	U

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 17, 2017 at 10:40:45

UNCLASSIFIED

Missile Defense Agency
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c -
113	0604894C	Multi-Object Kill Vehicle	04		71,513	71,513					U
115	0305103C	Cyber Security Initiative	04	941	969	969					U
116	1206893C	Space Tracking & Surveillance System	04								U
117	1206895C	Ballistic Missile Defense System Space Programs	04								U
	Advanced Component Development And Prototypes			5,898,841	5,661,070	5,733,708					
155	0605502C	Small Business Innovation Research - MDA	06	88,694							U
184	0901598C	Management HQ - MDA	06	35,871	31,160	31,160					U
	Management Support			124,565	31,160	31,160					
Total Missile Defense Agency				6,210,652	5,892,757	5,969,695					

UNCLASSIFIED

Missile Defense Agency
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

17 May 2017

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	S e c
113	0604894C	Multi-Object Kill Vehicle	04	71,513	71,513		71,513	6,500		6,500	U
115	0305103C	Cyber Security Initiative	04	969	969		969	986		986	U
116	1206893C	Space Tracking & Surveillance System	04					34,907		34,907	U
117	1206895C	Ballistic Missile Defense System Space Programs	04					16,994		16,994	U
		Advanced Component Development And Prototypes		5,661,070	5,733,708		5,733,708	5,879,210		5,879,210	
155	0605502C	Small Business Innovation Research - MDA	06								U
184	0901598C	Management HQ - MDA	06	31,160	31,160		31,160	29,947		29,947	U
		Management Support		31,160	31,160		31,160	29,947		29,947	
Total Missile Defense Agency				5,892,757	5,969,695		5,969,695	6,200,711		6,200,711	

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
27	03	0603176C	Advanced Concepts and Performance Assessment.....	Volume 2a - 1
28	03	0603177C	Discrimination Sensor Technology.....	Volume 2a - 9
29	03	0603178C	Weapons Technology.....	Volume 2a - 17
30	03	0603179C	Advanced C4ISR.....	Volume 2a - 25
31	03	0603180C	Advanced Research.....	Volume 2a - 31
34	03	0603274C	Special Program - MDA Technology.....	Volume 2a - 41
40	03	0603294C	Common Kill Vehicle Technology.....	Volume 2a - 43

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
74	04	0603881C	Ballistic Missile Defense Terminal Defense Segment.....	Volume 2a - 51
75	04	0603882C	Ballistic Missile Defense Midcourse Defense Segment.....	Volume 2a - 85
77	04	0603884C	Ballistic Missile Defense Sensors.....	Volume 2a - 123

UNCLASSIFIED

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
78	04	0603890C	BMD Enabling Programs.....	Volume 2a - 163
79	04	0603891C	Special Programs - MDA.....	Volume 2a - 275
80	04	0603892C	AEGIS BMD.....	Volume 2a - 277
81	04	0603893C	Space Tracking and Surveillance System.....	Volume 2a - 349
82	04	0603895C	Ballistic Missile Defense System Space Programs.....	Volume 2a - 367
83	04	0603896C	Ballistic Missile Defense Command and Control, Battle Management & Communication.....	Volume 2a - 383
84	04	0603898C	Ballistic Missile Defense Joint Warfighter Support.....	Volume 2a - 441
85	04	0603904C	Missile Defense Integration and Operations Center (MDIOC).....	Volume 2a - 487
86	04	0603906C	Regarding Trench.....	Volume 2a - 517
87	04	0603907C	Sea Based X-Band Radar (SBX).....	Volume 2a - 519
88	04	0603913C	Israeli Cooperative Programs.....	Volume 2a - 535
89	04	0603914C	Ballistic Missile Defense Test.....	Volume 2a - 555
90	04	0603915C	Ballistic Missile Defense Targets.....	Volume 2a - 595
94	04	0604115C	Technology Maturation Initiatives.....	Volume 2a - 637
96	04	0604181C	Hypersonic Defense.....	Volume 2a - 673
105	04	0604873C	Long Range Discrimination Radar (LRDR).....	Volume 2a - 683
106	04	0604874C	Improved Homeland Defense (HLD) Interceptors.....	Volume 2a - 703
107	04	0604876C	Ballistic Missile Defense Terminal Defense Segment Test.....	Volume 2a - 719

UNCLASSIFIED

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
108	04	0604878C	Aegis BMD Test.....	Volume 2a - 735
109	04	0604879C	Ballistic Missile Defense Sensor Test.....	Volume 2a - 759
110	04	0604880C	Land Based SM-3 (LBSM3).....	Volume 2a - 775
111	04	0604881C	AEGIS SM-3 Block IIA Co-Development.....	Volume 2a - 797
112	04	0604887C	Ballistic Missile Defense Midcourse Defense Segment Test.....	Volume 2a - 819
113	04	0604894C	Multi Object Kill Vehicle.....	Volume 2a - 837
115	04	0305103C	Cyber Security Initiative.....	Volume 2a - 851
116	04	1206893C	Space Tracking and Surveillance System (STSS).....	Volume 2a - 857
117	04	1206895C	Ballistic Missile Defense System Space Programs.....	Volume 2a - 881

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
155	06	0605502C	Small Business Innovation Research - MDA.....	Volume 2a - 897
184	06	0901598C	Management HQ - MDA.....	Volume 2a - 901

UNCLASSIFIED

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Program Element Table of Contents (Alphabetically by Program Element Title)

Program Element Title	Program Element Number	Line #	BA	Page
AEGIS BMD	0603892C	80	04.....	Volume 2a - 277
AEGIS SM-3 Block IIA Co-Development	0604881C	111	04.....	Volume 2a - 797
Advanced C4ISR	0603179C	30	03.....	Volume 2a - 25
Advanced Concepts and Performance Assessment	0603176C	27	03.....	Volume 2a - 1
Advanced Research	0603180C	31	03.....	Volume 2a - 31
Aegis BMD Test	0604878C	108	04.....	Volume 2a - 735
BMD Enabling Programs	0603890C	78	04.....	Volume 2a - 163
Ballistic Missile Defense Command and Control, Battle Management & Communication	0603896C	83	04.....	Volume 2a - 383
Ballistic Missile Defense Joint Warfighter Support	0603898C	84	04.....	Volume 2a - 441
Ballistic Missile Defense Midcourse Defense Segment	0603882C	75	04.....	Volume 2a - 85
Ballistic Missile Defense Midcourse Defense Segment Test	0604887C	112	04.....	Volume 2a - 819
Ballistic Missile Defense Sensor Test	0604879C	109	04.....	Volume 2a - 759
Ballistic Missile Defense Sensors	0603884C	77	04.....	Volume 2a - 123
Ballistic Missile Defense System Space Programs	0603895C	82	04.....	Volume 2a - 367
Ballistic Missile Defense System Space Programs	1206895C	117	04.....	Volume 2a - 881
Ballistic Missile Defense Targets	0603915C	90	04.....	Volume 2a - 595

UNCLASSIFIED

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Ballistic Missile Defense Terminal Defense Segment	0603881C	74	04.....	Volume 2a - 51
Ballistic Missile Defense Terminal Defense Segment Test	0604876C	107	04.....	Volume 2a - 719
Ballistic Missile Defense Test	0603914C	89	04.....	Volume 2a - 555
Common Kill Vehicle Technology	0603294C	40	03.....	Volume 2a - 43
Cyber Security Initiative	0305103C	115	04.....	Volume 2a - 851
Discrimination Sensor Technology	0603177C	28	03.....	Volume 2a - 9
Hypersonic Defense	0604181C	96	04.....	Volume 2a - 673
Improved Homeland Defense (HLD) Interceptors	0604874C	106	04.....	Volume 2a - 703
Israeli Cooperative Programs	0603913C	88	04.....	Volume 2a - 535
Land Based SM-3 (LBSM3)	0604880C	110	04.....	Volume 2a - 775
Long Range Discrimination Radar (LRDR)	0604873C	105	04.....	Volume 2a - 683
Management HQ - MDA	0901598C	184	06.....	Volume 2a - 901
Missile Defense Integration and Operations Center (MDIOC)	0603904C	85	04.....	Volume 2a - 487
Multi Object Kill Vehicle	0604894C	113	04.....	Volume 2a - 837
Regarding Trench	0603906C	86	04.....	Volume 2a - 517
Sea Based X-Band Radar (SBX)	0603907C	87	04.....	Volume 2a - 519
Small Business Innovation Research - MDA	0605502C	155	06.....	Volume 2a - 897
Space Tracking and Surveillance System	0603893C	81	04.....	Volume 2a - 349
Space Tracking and Surveillance System (STSS)	1206893C	116	04.....	Volume 2a - 857

UNCLASSIFIED

UNCLASSIFIED

Missile Defense Agency • Budget Estimates FY 2018 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Special Program - MDA Technology	0603274C	34	03.....	Volume 2a - 41
Special Programs - MDA	0603891C	79	04.....	Volume 2a - 275
Technology Maturation Initiatives	0604115C	94	04.....	Volume 2a - 637
Weapons Technology	0603178C	29	03.....	Volume 2a - 17

UNCLASSIFIED

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

**Missile Defense Agency
Fiscal Year (FY) 2018
Budget Estimates**

OVERVIEW



Approved for Public Release
Vol 2a 17-C-0358 (26 April 2017)
Vol 2b 17-C-0359-1 (11 May 2017)

Missile Defense Agency (MDA)
Fiscal Year 2018 Budget Overview

The Missile Defense Agency (MDA) requests \$7.9 billion in Fiscal Year (FY) 2018, an increase of \$379 million from the FY 2017 budget request, to strengthen and expand the deployment of defenses for our Nation, deployed forces, allies, and international partners against increasingly capable ballistic missiles. The FY 2018 missile defense program will continue to support the Warfighter and needs of the Combatant Commanders with the development, testing, deployment, and integration of interceptors, sensors, and the command, control, battle management and communications (C2BMC) system for the Ballistic Missile Defense System (BMDS). The FY 2018 budget continues to preserve homeland and regional missile defense priorities and invests in advanced technology development and future capabilities to counter the proliferation of increasingly complex threats. MDA is very cognizant of the growing cyber threat and is aggressively working to ensure the Nations missile defenses are resilient and able to operate in a highly contested environment. We are working with the Services, the Combatant Commanders, and other agencies in DoD and our partners in the Federal Government to counter this growing threat.

The following discussion provides a summary of highlights of the major Program Elements, but does not necessarily examine all funding and activities included within each Program Element.

I. Homeland Defense

With this budget request, MDA remains committed to operating, sustaining, expanding and improving our nation's homeland missile defenses. We propose continuing the development, testing, operations and sustainment of the GMD weapon system. PB18 request includes:

- \$828.1 million for *the Ground-based Midcourse Defense (GMD) (PE0603882C)*. MDA continues the development and expansion of long-range GMD capabilities with 32 currently deployed Ground-Based Interceptors (GBIs) at Fort Greely,

Alaska (FGA), and four GBIs at Vandenberg Air Force Base (VAFB) in California. MDA will complete deployment of eight additional GBIs in Alaska by the end of 2017, for a total of 44 GBIs to improve protection against North Korean and potential Iranian ICBM threats as they emerge. MDA will replace aging ground system infrastructure and fire control and kill vehicle (KV) software to improve discrimination capabilities.

- \$465.5 million for Improved Homeland Defense Interceptors (*PE 0604874C*) to continue the development of the GMD Redesigned Kill Vehicle (RKV). The RKV will address the evolving threat, enhance kill vehicle reliability, and improve in-flight communications to better utilize off-board sensor data. MDA will complete All-Up-Round (AUR) Preliminary Design and Critical Design and support development of the first RKV flight test (CTV-03) to demonstrate RKV integration and performance in flight test. MDA will continue AUR systems engineering to support the testing and fielding of RKV and C1, C2, and C3 booster equipped interceptors. MDA will continue development of alternative seeker for the redesigned kill vehicle until after the RKV Critical Design Review (CDR). We anticipate deploying the RKV beginning in the 2022 timeframe.
- \$76.8 million for Ground-based Midcourse Defense Test (*PE0604887C*) in support of the Integrated Master Test Plan (IMTP). PB18 also includes the first GMD operational flight test, FTG-11, a Salvo intercept using GBIs launched from Vandenberg Air Force Base, California (VAFB). This intercept test will exercise firing doctrine against an ICBM target with associated objects that will be launched from Reagan Test Site (RTS). MDA will also initiate planning for range and data collection assets for Flight Test GM-Controlled Test Vehicle-03 (GM CTV-03), a non-intercept flight characterization mission with RKV to collect RKV flight environment data using a GBI launched from VAFB.
- \$137.9 million for the *Operation and Maintenance* (O&M) of the GMD weapon system. This includes operation, maintenance and sustainment of the GMD weapon system and operational and support facilities at FGA and VAFB. It also includes Warfighter training, wargames, and exercises to improve readiness.

MDA requests \$130.7 million for the Sea-Based X-band (SBX) radar (*PE 0603907C*). The SBX radar provides precision midcourse tracking debris mitigation, and discrimination capabilities. The SBX continues to participate in flight tests. The budget request

includes funds to extend on-station time from 120 days at sea to 330 days to expand contingency operations for defense of the homeland at the request of the U.S. Pacific Command (USPACOM) and U.S. Northern Command (USNORTHCOM). MDA continues the SBX East Coast siting study tasked by the FY 2016 NDAA with emphasis on existing DoD facilities to minimize cost of infrastructure and security. The study is on track for reporting not later than 31 December 2018. Initial site screening has been completed, and site visits and evaluation are planned for 2nd and 3rd quarter FY 2017, with environmental documentation for the highest rated sites to begin later in FY 2017.

The budget requests \$357.7 million for the Long Range Discrimination Radar (LRDR) (*PE 0604873C*). The LRDR is a midcourse sensor that will improve BMDS target discrimination capability while supporting a more efficient utilization of the GMD interceptor inventory. In FY 2018, MDA will complete the design and purchase critical radar antenna components. MDA will also initiate qualification and sub-system testing for the LRDR.

The LRDR site will be constructed as two separate military construction (*MILCON*) projects. Phase 1 (\$155 million, FY 2017) funded a Shielded Mission Control Facility and Radar Foundation. MDA began military construction of Phase 1 in FY 2017. Phase 2 (\$150 million, FY 2019) funds the shielded Power Plant that includes fuel storage, a maintenance facility, and associated site support, beginning in FY 2019.

MDA requests \$21 million (*PE 0603884C*, Budget Project MD41) in FY 2018 for Homeland Defense Radar – Hawaii (HDR-H) to conduct source selection activities. This radar will provide a persistent capability, augmented by other sensors to mitigate the effects of the evolving threats to the BMDS, optimize discrimination capability in the Pacific architecture, and increase the defensive capability of GBIs for the enhanced defense of Hawaii. MDA plans to compete and award a Pacific Radar contract in FY 2018 and deliver an initial capability by FY 2023.

II. Regional Defense

The FY 2018 President's Budget also reflects the Department's commitment to building regional missile defense forces that are interoperable with systems deployed by international partners. We continue to execute the European Phased Adaptive Approach (EPAA) designed to protect U.S. deployed forces and NATO allies in Europe from ballistic missile attacks from the Middle East. At the July 2016 Warsaw Summit, NATO Heads of State and Government declared the achievement of NATO BMD Initial Operational Capability. The NATO declaration highlights the U.S. work to field EPAA as our voluntary contribution to NATO BMD.

MDA successfully delivered EPAA Phase 2, which includes the Aegis Ashore site in Deveselu, Romania, in December 2015. This site, operationally certified by the Navy, houses the first operational land-based Aegis BMD weapon system with the capability to launch Standard Missile (SM)-3 Block IAs and IBs to protect European NATO allies and deployed U.S. forces in Europe. The U.S. Navy will continue to operate the Aegis Ashore site in Romania as an integral part of NATO's BMD architecture, which includes a forward-based Army Navy/Transportable Radar Surveillance System (AN/TPY-2) in Turkey, BMD-capable Aegis Destroyers homeported in Rota, Spain, SM-3 interceptors, and a command-and-control node operated from Ramstein Air Base, Germany.

EPAA Phase 3 is scheduled to be delivered by the end of CY 2018. It will consist of an Aegis Ashore site in Poland, and an upgraded version of the Aegis BMD weapon system with a new SM-3 variant, the Block IIA. Aegis Ashore site construction in Poland began in FY 2016 and MDA will complete construction by the end of CY 2018. For EPAA Phase 3, Aegis Ashore sites and upgraded Aegis BMD ships will be capable of launching SM-3 Block IA, IB, and IIA, variants providing improved defensive coverage against short-, medium-, and intermediate-range threats. MDA requests \$59.7 million in FY 2018 procurement funds for Aegis Ashore in Poland. The funding addresses the multiple actions required to field the Aegis Ashore end item in Poland by the end of the calendar year 2018, keep the individual components up to date with the Navy's destroyer modernization plan, and install modifications as required to enhance co-existence with Broadband Wireless Access systems in the European theater.

We propose continuing the development, testing, operations and sustainment of the Aegis BMD Program. PB18 request includes:

- \$852.1 million in for Aegis BMD (*PE 0603892C*). This includes the integration of the SM-3 Block IIA into the BMD Weapon Systems, transition of Kinetic Warhead hardware commonality effort to system integration testing, and pre-production All-Up-Rounds to support the initial deployment for EPAA Phase 3. MDA is strongly committed to increase the Aegis Weapon System in alignment with Navy requirements to increase performance against SRBM, MRBM, and IRBM ballistic threats. Utilizing improved radar discrimination, Aegis will increase capability against longer range and more sophisticated threats. In FY18, MDA continues software development for Integrated Air and Missile Defense (IAMD) Baseline 9.C2 (BMD 5.1) in support of EPAA Phase 3 and the IAMD Baseline 10 (BMD 6.0). The BMD 6.0 Computer Upgrade will integrate BMD capability with the Advanced Air and Missile Defense Radar (AMDR) data, also known as the AN/SPY-6, for remote engagements and increased raid capacity with simultaneous multi-mission capabilities. Beginning in FY 2018, MDA will commence upgrades on the SM-3 Block IB hardware and software to leverage the capability of the SM-3 Block IIA.
- \$134.5 million for Aegis Testing (*PE 0604878C*). Aegis BMD Flight Test Program performs comprehensive testing of Aegis BMD components and demonstrates their interoperability with the BMDS. Using accredited Modeling & Simulation (M&S) the ground test program provides the evidence required for the MDA and Combatant Commanders to transition the capability to the Operational Capacity Baseline. MDA plans to conduct Flight Test Standard Missile (FTM-29) and (FTO)-03 Events 1 and 2 using Aegis BMD Weapon System 5.1 and the SM-3 Block IIA missiles. These development and operational tests support the U.S. Navy certifications as well as EPAA commitments. MDA also plans to conduct Flight Test Experimental Advanced Technology -01 (FEV-01). The FEV-01 is an experimental demonstration of an Aegis BMD ship engagement of a MRBM target by an SM-3 Block IB missile using Launch on Remote (LoR) based on Discrimination Sensor Technology (DST) data provided by Reapers equipped with Multi-Spectral Targeting System, Type C (MTS-C).
- MDA requests a total \$624.1 million in procurement for Aegis BMD, which plays a critical role in both homeland and regional defense. MDA is requesting \$425.0 million to procure 34 Aegis SM-3 Block IB missiles in FY 2018, along with associated hardware and support costs. A total of 287 SM-3 Block IB missiles will be procured and 182 delivered to the Fleet by the end

of FY 2018. MDA requests \$38.7 million for advance procurement for long lead materials associated with the FY 2018- 22 SM-3 Block IB missile buy to ensure timely delivery to the Combatant Commander. The procurement budget also requests \$160.3 million for Aegis BMD Weapon Systems consisting of, Aegis shipset equipment, software and installation materials. MDA will continue to deliver SM-3 Block IBs to the Navy for deployment on land at the Aegis Ashore site in Romania and at sea on multi-mission Aegis ships with BMD capability. MDA is continuing work with the U.S. Navy on AN/SPY-1 radar antenna improvements which, when coupled with the appropriate Aegis Weapon System computer program, will increase radar detection sensitivity. The preliminary requirements and design for the AN/SPY-1 refurbishment are complete, including full-scale tests to demonstrate tracking capability against live targets. MDA and the Navy plan to field the refurbished antennas onboard selected Aegis DDG Flight I and II ships starting in the FY 2022 timeframe.

- \$96.3 million of Operation and Maintenance (O&M) funding for the Aegis BMD program to perform missile recertification, repair efforts, demilitarization, and Ordnance Assessment/Surveillance. This funding supports BMD Computer Program, Ship Equipment, and Aegis Ashore - Romania sustainment, as well as Fleet integration support.

Terminal High Altitude Area Defense (THAAD) is a transportable, ground-based missile defense system that defends against regional ballistic missiles in the terminal stage of flight. THAAD provides Combatant Commanders a rapidly deployable capability to deepen, extend, and complement BMDS homeland and regional defenses. MDA supports forward-deployment of one THAAD battery in Guam. Recent provocations further demonstrate the serious threat North Korea poses to the Republic of Korea (ROK), the Asia-Pacific region, and our forward deployed forces. U.S. Pacific Command re-stationed the first elements of the THAAD system to the Republic of Korea (ROK) on March 6, 2017 implementing the U.S.-ROK Alliance's July 2016 decision to bring the defense capability to the peninsula. The deployment of THAAD contributes to a layered missile defense system and enhances the U.S.-ROK Alliance's defense against North Korean missile threats. PB18 request includes:

- \$230.2 million for BMD Terminal Defense (PE 0603881C), THAAD development efforts. MDA will continue development of THAAD software upgrades such as implementation of flexible threat packages and defense planning, improved capability to engage SRBM, MRBM and limited IRBM threats, and integration of the THAAD battery capability into the Integrated Air and Missile Defense Battle Command System (IBCS) planning process.
- \$36.2 million for Terminal Defense Testing (*PE 0604876C*). In FY 2018, THAAD will conduct Flight Test Other-35 (FTX-35), a ballistic missile tracking test to prove THAAD software build 3.0 and test X86 AN/TPY-2 radar configuration with a THAAD Battery. THAAD will participate in Flight Test Other -36 (FTX-36), a ballistic missile tracking test, to demonstrate interoperability between THAAD and PATRIOT. THAAD will also begin pre-mission planning for (FTO-03 E2) to be executed in FY 2019.
- \$451.6 million to continue procurement of THAAD equipment, including 34 THAAD interceptors in FY 2018. By the end of FY 2018, MDA will deliver 52 additional THAAD interceptors to the U.S. Army, for a total of 210 interceptors delivered. MDA received an incremental production decision in the 4th Quarter FY2016 for THAAD authorizing continued production of at least 79 additional interceptors through FY 2020.
- \$78.8 million of Operations and Maintenance (O&M) funding to support the maintenance and upkeep of all BMDS unique items of the fielded THAAD batteries as well as for all THAAD training devices. In FY 2018 MDA will provide support to seven THAAD batteries.

III. Developing New Capabilities

MDA is developing advanced BMD technologies that can be integrated into the BMDS to adapt to future threat changes. The investment strategy for these technologies balances the need to address the most dangerous current threats with the need to position the U.S. to respond to threat developments in the future. Areas for technology investment include: persistent discrimination in the current and future BMDS sensor architecture; high power lasers; Multi- Object Kill Vehicle (MOKV) technology and other advanced

technology for high-risk/high-pay off breakthroughs. The advanced technology investments are informed by capability gap assessments and focus on concepts that bring upgraded capability to the Warfighter. The goal is to provide capabilities that enable the future BMDS to keep pace with new and evolving threats.

MDA requests \$128.4 million for Technology Maturation Initiatives (*PE 0604115C*) to build on the foundational successes in Weapons Technology and Discrimination Sensor Technology. MDA will integrate an advanced sensor into the tactically proven Multispectral Targeting System and MQ-9 Reaper combination to address precision track and discrimination performance of this technology with the goal of eventually migrating to a space sensor layer. MDA will continue the design and begin fabrication of a UAV-borne laser for boost phase missile defense. Adding a boost phase layer of sensors and weapons to the missile defense architecture could increase the performance and effectiveness of the BMDS.

MDA requests \$252.9 million for the Common Kill Vehicle Technology Program (*PE 0603294C*) to establish the technology foundation for killing multiple lethal objects from a single interceptor. MDA is on contract with three major primes for a three year, competitive program to reduce the technical risk for MOKV product development beginning late calendar year 2020. Note: In FY 2018, funding for MOKV Risk Reduction is requested in the Common Kill Vehicle Technology program element 0603294C. MOKV Development is requested in the MOKV program element 0604894C.

MDA requests \$20.2 million for the Advanced Research Program (*PE 0603180C*) to conduct innovative research and development with small businesses, universities, and international partners to create and advance future missile defense capability. MDA continues to capitalize on the creativity and innovation of the nation's small business community and academia to enhance the BMDS.

MDA also requests \$13.0 million for the Advanced Concepts & Performance Assessment effort (*PE 0603176C*), which centralizes advanced technology concept modeling, simulation, and performance analysis and delivers independent assessments of government, university, and industry technology concepts that, along with systems engineering requirements, support acquisition strategy decisions and define our technology focus areas. The request will fund the digital simulation and hardware-in-the-loop infrastructure required

for testing of an airborne advanced sensor, Kill Vehicle Modular Open Architecture testbed, pre- and post-mission performance predictions and assessments, and mature related tracking, discrimination, and sensor fusion algorithms.

IV. Space

MDA requests \$17.0 million in the BMD Space program (*PE 1206895C*,) for the Spacebased Kill Assessment (SKA) experiment. SKA will use a network of fast frame rate and infrared sensors hosted on commercial satellites to deliver an experimental kill assessment capability tailored to homeland defense. The full SKA network is currently planned to be on orbit in FY 2017. This request also supports development of kill assessment algorithms required to add SKA to the operational BMDS. MDA also requests \$34.9 million for Space Tracking and Surveillance System (STSS) satellite operations and sustainment (*PE 1206893C*). STSS consists of two satellites operating in Low Earth Orbit and provides risk reduction data for a potential operational BMDS tracking and surveillance constellation in the areas of sensor management, target signatures, discrimination, and fire control loop closure. STSS will continue participating in MDA test events and data collections providing battlespace awareness, technical intelligence, and space situational awareness to the Warfighter. This request also funds the Missile Defense Space Center (MDSC), which provides a collaborative environment to exploit and integrate STSS and other national security space assets for ballistic missile defense. MDA is also funding the implementation of a Post Intercept Assessment (PIA) capability that will include a PIA database and display. Note: The Department has created a new Major Force Program (MFP) 12 to more clearly identify space programs. These new PE's have been fully transferred from PE 0603895C, and PE 0603893C respectively beginning in FY 2018 but are not new starts.

V. Other Program Highlights

BMD Sensors (*PE 0603884C*) along with the accompanying O&M, supports both homeland and regional defense missions. For homeland defense, MDA requests \$191.1 million to sustain Cobra Dane, the Upgraded Early Warning Radars (UEWR), and the AN/TPY-2 radars. The Services and Combatant Commands, with logistical support from MDA, operate AN/TPY-2 (Forward Based

Mode) radars in Japan (two radars), Israel, Turkey, and United States Central Command (USCENTCOM) in support of regional defense. MDA continues to support the AN/TPY-2 radar (Terminal Mode) as part of a forward deployed THAAD battery in Guam.

MDA requests \$213.5 million to develop advanced discrimination algorithms for the AN/TPY-2, Cobra Dane, Sea Based X-Band, and the UEWR radars to counter evolving threats. The discrimination improvement effort will develop and field integrated Element capabilities to improve BMDS ability to discriminate between lethal and non-lethal objects. In FY 2018, MDA will transition to production of next generation Gallium Nitride (GaN) Transmit/Receive Integrated Multichannel Modules (TRIMMs) to support the AN/TPY-2 sparing strategy and improve radar performance. \$10 million is budgeted for Gallium Nitride transition. Additionally, MDA plans \$5 million for an Atlantic Radar study to assess the feasibility of long-range discrimination radar or other appropriate tracking and discrimination sensor capabilities in a location optimized to support the defense of the United States against emerging long-range ballistic missile threats from Iran. MDA request \$84.2 million for BMD Sensors testing activities (*PE 0604879C*) for planning, analysis and execution of BMDS flight test events, including pre- and post-test efforts such as Digital and Hardware-in-the-Loop (HWIL) Pre-Mission Tests (PMTs) and Post-Flight Reconstruction (PFR). Sensors Test also provides planning, analysis and execution for BMD System level ground tests identified in the Integrated Master Test Plan (IMTP).

C2BMC (*PE 0603896C*) provides persistent tracking, cueing, discrimination and fire control quality data to Aegis BMD, GMD, THAAD, and PATRIOT systems and coalition partners to support homeland and regional missile defense objectives. C2BMC also provides sensor control and management of AN/TPY-2 (Forward-Based Mode) radars worldwide to support homeland and regional missile defense and provides the warfighter tools for BMDS situational awareness and decision making. MDA requests \$430.1 million to sustain the current C2BMC global capability (Spiral 6.4) and complete development and fielding of enhanced tracking, discrimination, and battle management capability to support homeland and regional missile defense in 2018 (Spiral 8.2-1). MDA will continue development of sensor management and tracking improvements to enable Aegis BMD Engage on Remote capability (Spiral 8.2-3) and integration of the LRDR to support homeland defense engagements (Spiral 8.2-5). C2BMC upgrades in 2018 will enhance

current C2BMC capability, integrate new space sensors, and enable sustainment of C2BMC global capability. Development activities for Aegis BMD Engage on Remote will provide a five-fold increase in defended area via critical sensor management and track reporting improvements and enhanced space sensor support. MDA continues development of C2BMC control and management of LRDR and enhanced track and discrimination reporting to GMD in support of homeland defense.

MDA requests \$200.2 million to perform the systems engineering required to design, build, test, assess and field the integrated BMDS (*PE 0603890C, Budget Projects MD24, and MD31*). BMD System-level engineering and integration ensures the delivery of new capabilities to defeat the evolving threat, enables interoperability between U.S. forces and international partners, and drives future capability development from a system perspective to maximize the effectiveness of BMD technologies. In FY 2018, MDA will complete the engineering and technical assessment that underpins the EPAA Phase 3 Technical Capability Declaration (TCD). The TCD will provide confidence to the Warfighter that the Aegis Ashore site in Poland will operate as designed. MDA employs BMD System and element-level models and simulations to verify BMDS performance and assess BMDS capability to engage and defeat complex threats across a spectrum of scenarios that cannot be demonstrated in flight tests. As a result, MDA is able to deliver to the Warfighter evolving, integrated, and layered BMDS performance and capabilities that have been thoroughly assessed and validated through testing and Modeling and Simulation. In this budget cycle, MDA is pursuing improvements to both System-level digital simulation and integrated System-level ground test simulations. Beginning in FY 2018, MDA will initiate an Aegis Ashore (AA) Air and Missile Self Defense Study. The study will provide recommendations on capabilities to protect AA sites from air and missile attacks.

In FY 2018, MDA will increase Hypersonic Defense systems engineering activities, technology demonstrations, and risk reduction, as a continuation of FY 2017 Department of Defense efforts to address weapons technologies to defeat advanced threats. Activities will include completion of a Defense against Hypersonic Threats AoA, capability roadmap development, and initial investment in sensor technology demonstrations and weapon concepts to address the advanced threat. MDA will leverage existing sensors and ground

infrastructure/Command and Control to quickly demonstrate and deploy a three-phase limited contingency capability to provide real-time warning over the majority of the hypersonic threat profile by 2019. MDA is requesting \$75.3 million for Hypersonic Defense activities in FY 2018, *(PE 0604181C)*.

MDA's budget request puts a priority on cybersecurity operations. MDA will train, educate, develop and grow MDA's cybersecurity workforce to support the mission. These efforts reflect a commitment to make a fundamental shift in our cybersecurity culture by improving human performance and accountability in support of the DoD Cyber Strategy and comply with the DoD Cybersecurity Discipline Implementation Plan. The MDA Cyber Operations Program is vital to the operational development of the BMDS and the MDA Research, Development and Test missions. The program has several initiatives, including Computer Network Defense (CND), Certification and Accreditation (C&A) activities, and Computer Emergency Response Teams (CERT). The MDA Cyber Operations Program is part of a multi-tiered CND capability that quickly adapts to near-term changes, continuously evolves to meet long-range threat and technology trends, and unites all missile defense elements under the coordination and direction of a single lead organization, United States Cyber Command, to conduct multi-component and defense-wide CND operations. The information security framework will be integrated into the agency infrastructure to connect MDA systems around the world.

MDA, in conjunction with IMTP stakeholders, plans and executes a fully integrated test program that synchronizes the system under test with the Warfighters trained to operate the system under varying wartime conditions against current and emerging threats. For flight testing, the Agency incorporates the nine (9) operational realism criteria as defined by the Ballistic Missile Defense System Response to National Defense Authorization Act Section 234, for Fiscal Year 2005, Increasing Operational Realism. Thirty-one (31) of the seventy-four (74) flight tests in the BMDS Test Program are currently planned to achieve these criteria. For system-level ground testing, all tests culminate in operational testing with Warfighters on console and independent operational assessments by the BMDS Operational Test Agency Team. This ensures that BMDS capabilities are credibly demonstrated and validated prior to delivery to the Warfighter.

MDA works collaboratively with the Director, Operational Test & Evaluation; Deputy Assistant Secretary of Defense, Developmental Test and Evaluation; Commander, Joint Functional Component Command for Integrated Missile Defense; Service Operational Test Agencies and the Joint Interoperability Test Command to identify and incorporate all testing requirements into development of the IMTP, a comprehensive, highly integrated, complex, cost-effective series of flight tests, ground tests, wargames, and exercises.

MDA continues to support and expand work with international partners to include conducting joint analyses to support missile defense acquisition decisions, cooperative research and development projects, deployments, and co-production. MDA requests \$9.7 million to complete Aegis SM-3 Block IIA Cooperative Development Program (*PE 0604881C*). This is a cooperative effort between the U.S. Department of Defense and the Japan Ministry of Defense. SM-3 Block IIA development builds upon established joint research investments by the United States and Japan. MDA is committed to delivering the SM-3 Block IIA to the Fleet to meet global threat requirements and support EPAA Phase 3.

This budget continues MDA's longstanding support of U.S.-Israeli Cooperative BMD Programs, to include the co-development of the David's Sling Weapon System, Upper Tier Interceptor, and Arrow Weapon System Improvements. MDA works with the Israeli Missile Defense Organization on these programs in accordance with jointly signed international agreements.

VI. Summary

MDA requests \$7.9 billion in FY 2018 to strengthen and expand the deployment of defenses for our Nation, deployed forces, allies, and international partners against increasingly capable ballistic missiles.

**Missile Defense Agency
President's Budget (PB) 2018-2022
FY 2018- FY 2022 Appropriation Summary
R-1 Exhibit
(\$ Thousands)**

Line Number	Program Element	Budget Project	Program	Budget Activity	FY16 Actual	FY17	FY18	FY19	FY20	FY21	FY22	FY18-22
O&M												
11A	0208866C		O&M	NA	422,950	467,275	504,058	495,950	522,599	544,281	574,889	2,641,777
		MD08	Ground Base Midcourse	NA	133,705	129,281	137,896	143,027	139,319	142,269	145,188	707,699
		MD07	THAAD	NA	57,925	72,099	78,761	87,478	92,082	91,832	93,716	443,869
		MD09	AEGIS	NA	43,500	73,039	96,346	86,784	109,209	107,246	117,367	516,952
		MD11	BMDS AN/TPY-2 Radars	NA	187,820	192,856	191,055	178,661	181,989	202,934	218,618	973,257
			Budget Activity 00 Total	NA	422,950	467,275	504,058	495,950	522,599	544,281	574,889	2,641,777
			O&M Total	NA	422,950	467,275	504,058	495,950	522,599	544,281	574,889	2,641,777
Procurement												
35	0208866C		PROCUREMENT	01	1,489,203	1,139,503	1,178,364	1,576,815	1,535,529	1,522,410	1,555,094	7,368,212
		MD07	THAAD	01	447,971	520,608	451,592	440,883	405,015	420,829	429,463	2,147,782
		MD09	AEGIS BMD	01	586,711	463,801	463,756	632,361	609,478	647,403	634,023	2,987,021
		MD26	Israeli Program	01	0	0	0	392,000	390,000	388,000	386,000	1,556,000
		MD11	BMDS AN/TPY-2 Radars	01	78,634	5,503	947	13,572	10,168	8,020	15,336	48,043
		MD73	Aegis Ashore Phase III	01	30,587	57,493	59,739	0	0	0	0	59,739
		MD34	David's Sling	01	150,000	0	0	0	0	0	0	0
		MD83	Iron Dome	01	55,000	42,000	42,000	0	0	0	0	42,000
		MD20	Arrow Upper Tier	01	15,000	0	0	0	0	0	0	0
		MD90	Aegis BMD Hardware and Software	01	125,300	50,098	160,330	97,999	120,868	58,158	90,272	527,627
			Budget Activity 01 Total	01	1,489,203	1,139,503	1,178,364	1,576,815	1,535,529	1,522,410	1,555,094	7,368,212
			Procurement Total	01	1,489,203	1,139,503	1,178,364	1,576,815	1,535,529	1,522,410	1,555,094	7,368,212
RDT&E												
27	0603176C		Advanced Concepts and Performance Assessment	03	11,853	17,880	12,996	13,741	15,048	15,319	16,361	73,465
		MD71	Advanced Concepts and Performance Assessments	03	11,283	17,298	11,612	11,765	11,924	12,096	12,368	59,765
		MD40	Program-Wide Support	03	570	582	829	676	720	762	805	3,792
		MC71	Cyber Operations	03	0	0	555	1,300	2,404	2,461	3,188	9,908
28	0603177C		Discrimination Sensor Technology	03	27,981	0	0	0	0	0	0	0
		MD95	Discrimination Sensor Technology	03	23,141	0	0	0	0	0	0	0
		MT95	Discrimination Sensor Tech-Flight Test Execution	03	3,693	0	0	0	0	0	0	0
		MD40	Program-Wide Support	03	1,147	0	0	0	0	0	0	0
29	0603178C		Weapons Technology	03	50,263	71,843	5,495	0	0	0	0	5,495
		MD69	Directed Energy Research	03	25,314	47,691	5,495	0	0	0	0	5,495
		MD72	Interceptor Technology	03	22,818	22,000	0	0	0	0	0	0
		MD40	Program-Wide Support	03	2,131	2,152	0	0	0	0	0	0
30	0603179C		Advanced C4ISR	03	9,661	3,626	0	0	0	0	0	0
		MD73	Advanced C4ISR	03	9,197	3,462	0	0	0	0	0	0
		MD40	Program-Wide Support	03	464	164	0	0	0	0	0	0
31	0603180C		Advanced Research	03	16,987	27,733	20,184	20,695	21,555	21,936	22,361	106,731
		MD25	Advanced Technology Development	03	16,061	26,900	19,302	19,723	20,580	20,905	21,319	101,829
		MD40	Program-Wide Support	03	926	833	882	972	975	1,031	1,042	4,902
34	0603274C		Special Program - MDA Technology	03	9,650	83,745	0	0	0	0	0	0
		MD81	Special Programs - MDA Technology	03	9,650	83,745	0	0	0	0	0	0
40	0603294C		Common Kill Vehicle Technology	03	60,851	0	252,879	321,175	110,934	0	0	684,988
		MD85	Common Kill Vehicle Technology	03	58,656	0	249,915	315,619	107,734	0	0	673,268
		MD40	Program Wide Support	03	2,195	0	2,964	5,556	3,200	0	0	11,720
			Budget Activity 03 Total	03	187,246	204,827	291,554	355,611	147,537	37,255	38,722	870,679
115	0305103C		Cyber Security Initiative	04	941	969	986	997	1,031	1,051	1,073	5,138
		MDCS	Cyber Security Initiative	04	941	969	986	997	1,031	1,051	1,073	5,138
74	0603881C		Ballistic Missile Defense Terminal Defense Segment	04	197,617	209,072	230,162	194,328	253,778	264,377	267,254	1,209,899
		MD07	THAAD	04	186,100	192,699	215,569	176,302	230,270	239,792	244,604	1,106,537
		MC07	Cyber Operations	04	572	5,605	3,325	7,563	10,595	10,686	8,698	40,867
		MD06	Patriot Advanced Capability-3 (PAC-3)	04	1,066	1,130	1,162	1,171	1,245	1,264	1,290	6,132
		MD40	Program-Wide Support	04	9,879	9,638	10,106	9,292	11,668	12,635	12,662	56,363
75	0603882C		Ballistic Missile Defense Midcourse Defense Segment	04	1,260,480	862,080	828,097	630,842	651,047	567,451	551,701	3,229,138
		MD08	Ground Based Midcourse	04	1,193,273	815,796	777,692	579,986	598,610	518,755	509,040	2,984,083

**Missile Defense Agency
President's Budget (PB) 2018-2022
FY 2018- FY 2022 Appropriation Summary
R-1 Exhibit
(\$ Thousands)**

Line Number	Program Element	Budget Project	Program	Budget Activity	FY16 Actual	FY17	FY18	FY19	FY20	FY21	FY22	FY18-22
		MC08	Cyber Operations	04	14,686	4,563	18,818	22,495	23,766	22,702	16,623	104,404
		MD40	Program-Wide Support	04	52,521	41,721	31,587	28,361	28,671	25,994	26,038	140,651
77	0603884C		Ballistic Missile Defense Sensors	04	233,020	230,077	247,345	247,643	362,850	401,267	497,503	1,756,608
		MD11	BMDS Radars	04	221,705	219,503	213,532	211,357	241,261	299,852	260,420	1,226,422
		MD41	Pacific Radar	04	0	0	21,000	25,800	99,000	83,300	216,060	445,160
		MC11	Cyber Operations	04	1,196	1,045	3,636	1,089	8,950	4,410	1,156	19,241
		MD40	Program-Wide Support	04	10,119	9,529	9,177	9,397	13,639	13,705	19,867	65,785
78	0603890C		BMD Enabling Programs	04	406,326	408,594	449,442	466,760	540,409	629,864	501,915	2,588,390
		MD24	System Engineering & Integration	04	146,148	139,866	150,358	151,837	157,982	156,943	156,690	773,810
		MT23	Enabling - Test	04	16,043	17,749	22,767	20,811	20,735	22,008	21,751	108,072
		MD28	Intelligence & Security	04	39,085	41,254	44,708	44,557	47,744	48,732	49,477	235,218
		MD30	BMD Information Management Systems	04	90,685	92,628	84,499	81,337	89,036	91,592	95,019	441,483
		MC30	Cyber Operations	04	27,194	22,881	41,458	45,070	56,616	73,479	56,086	272,709
		MD31	Modeling & Simulation	04	39,972	44,458	49,824	63,465	97,374	140,616	51,374	402,653
		MC31	Engineering Cyber Operations	04	613	253	3,838	6,500	13,308	34,988	13,448	72,082
		MD32	Quality, Safety, and Mission Assurance	04	28,864	31,022	30,516	29,796	31,387	31,901	32,550	156,150
		MD40	Program-Wide Support	04	17,722	18,483	21,474	23,387	26,227	29,605	25,520	126,213
79	0603891C		Special Programs - MDA	04	390,264	323,607	320,190	273,713	254,407	265,119	270,417	1,383,846
		MD27	Special Programs	04	390,264	323,607	320,190	273,713	254,407	265,119	270,417	1,383,846
80	0603892C		AEGIS BMD	04	804,211	959,066	852,052	805,051	789,217	656,164	695,306	3,797,790
		MD09	Aegis BMD	04	686,536	846,028	292,063	285,018	356,447	324,925	332,936	1,591,389
		MG09	Aegis BMD SM-3 Development Articles	04	0	0	253,276	166,129	73,523	18,291	0	488,954
		MM09	Aegis BMD SM-3 Development	04	0	0	93,414	121,268	125,305	74,922	111,278	548,452
		MC09	Cyber Operations	04	1,225	879	2,340	14,970	22,506	23,079	20,177	83,072
		MX09	Aegis BMD Development Support	04	80,312	68,283	169,325	177,360	174,101	182,794	197,100	900,680
		MD40	Program-Wide Support	04	36,138	43,876	41,634	40,306	37,335	32,153	33,815	185,243
81	0603893C		Space Tracking and Surveillance System	04	27,262	32,129	0	0	0	0	0	0
		MD12	Space Tracking and Surveillance System (STSS)	04	25,892	30,751	0	0	0	0	0	0
		MD40	Program-Wide Support	04	1,370	1,378	0	0	0	0	0	0
82	0603895C		Ballistic Missile Defense System Space Programs	04	21,040	20,690	0	0	0	0	0	0
		MD33	MD Space Exp Center (MDSEC)	04	20,031	19,755	0	0	0	0	0	0
		MD40	Program-Wide Support	04	1,009	935	0	0	0	0	0	0
83	0603896C		Ballistic Missile Defense Command and Control, Battle Management & Command & Control, Battle Management, Communications (C2BMC)	04	425,996	456,267	430,115	461,275	501,956	496,411	514,139	2,403,896
		MD01	Command & Control, Battle Management, Communications (C2BMC)	04	255,003	266,312	251,033	268,130	293,051	285,343	296,433	1,393,990
		MC01	Cyber Operations	04	4,256	905	5,305	11,021	15,706	15,684	19,530	67,246
		MT01	C2BMC Test	04	55,799	52,727	51,555	46,828	51,109	47,340	47,255	244,087
		MX01	Command & Control, Battle Management, Communications (C2BMC) L	04	96,140	116,552	103,440	114,132	120,070	125,220	127,736	590,598
		MD40	Program-Wide Support	04	14,798	19,771	18,782	21,164	22,020	22,824	23,185	107,975
84	0603898C		Ballistic Missile Defense Joint Warfighter Support	04	47,566	47,776	48,954	49,524	52,628	53,573	54,636	259,315
		MD03	Joint Warfighter Support	04	14,238	15,417	15,394	15,473	16,576	16,849	17,191	81,483
		MT03	Joint Warfighter Support Test	04	31,148	30,423	31,206	31,504	33,445	33,973	34,664	164,792
		MC03	Cyber Operations	04	0	0	152	155	157	160	162	786
		MD40	Program-Wide Support	04	2,180	1,936	2,202	2,392	2,450	2,591	2,619	12,254
85	0603904C		Missile Defense Integration and Operations Center (MDIOC)	04	46,191	54,750	53,265	54,505	57,588	58,574	59,738	283,670
		MD22	Missile Defense Integration and Operations Center (MDIOC)	04	43,587	51,773	50,261	51,261	54,269	55,090	56,210	267,091
		MC22	Cyber Operations	04	462	456	612	617	640	653	666	3,188
		MD40	Program-Wide Support	04	2,142	2,521	2,392	2,627	2,679	2,831	2,862	13,391
86	0603906C		Regarding Trench	04	8,918	8,785	9,113	17,100	18,798	12,377	12,721	70,109
		MD35	Regarding Trench	04	8,918	8,785	9,113	17,100	18,798	12,377	12,721	70,109
87	0603907C		Sea Based X-Band Radar (SBX)	04	81,265	93,287	130,695	114,545	126,250	97,666	97,659	566,815
		MX46	Sea Based X-Band Radar Development Support	04	78,108	90,178	126,737	110,449	120,400	92,966	93,001	543,553
		MD40	Program-Wide Support	04	3,157	3,109	3,958	4,096	5,850	4,700	4,658	23,262
88	0603913C		Israeli Cooperative Programs	04	267,595	103,835	105,354	108,002	109,742	111,901	114,219	549,218
		MD20	Israeli Upper Tier	04	74,550	55,793	56,861	58,285	59,225	60,392	61,631	296,394
		MD26	Israeli ARROW Program	04	56,519	10,831	10,841	11,125	11,288	11,508	11,761	56,523

**Missile Defense Agency
President's Budget (PB) 2018-2022
FY 2018- FY 2022 Appropriation Summary
R-1 Exhibit
(\$ Thousands)**

Line Number	Program Element	Budget Project	Program	Budget Activity	FY16 Actual	FY17	FY18	FY19	FY20	FY21	FY22	FY18-22
		MD34	Short Range Ballistic Missile Defense (SRBMD)	04	136,526	37,211	37,652	38,592	39,229	40,001	40,827	196,301
89	0603914C		Ballistic Missile Defense Test	04	290,267	293,441	305,791	295,042	351,626	336,137	334,678	1,623,274
		MD04	BMDS Test Development Program	04	0	0	0	0	17,500	28,900	22,600	69,000
		MT04	BMDS Test Program	04	276,311	277,851	288,516	278,141	315,226	288,333	293,327	1,463,543
		MC04	Cyber Operations	04	2,072	2,479	2,528	2,578	2,631	2,682	2,737	13,156
		MD40	Program Wide Support	04	11,884	13,111	14,747	14,323	16,269	16,222	16,014	77,575
90	0603915C		Ballistic Missile Defense Targets	04	517,589	563,576	410,425	373,203	407,909	405,458	427,508	2,024,503
		MC05	Cyber Operations	04	65	0	251	583	1,072	1,088	1,389	4,383
		MT05	BMDS Targets Program	04	503,325	539,837	391,957	354,629	388,179	385,097	405,953	1,925,815
		MD40	Program Wide Support	04	14,199	23,739	18,217	17,991	18,658	19,273	20,166	94,305
94	0604115C		Technology Maturation Initiatives	04	24,743	99,366	128,406	168,388	174,432	176,660	177,264	825,150
		MD98	Directed Energy Demonstrator Development	04	0	23,744	48,099	76,979	66,958	61,334	71,437	324,807
		MD99	Discrimination Sensor Demonstrator Development	04	18,362	57,382	73,295	76,985	93,876	103,683	95,845	443,684
		MT99	Technology Maturation Initiatives Test	04	2,070	13,508	220	4,476	4,327	1,857	0	10,880
		MC98	Cyber Operations	04	140	168	172	257	179	182	272	1,062
		MD40	Program Wide Support	04	4,171	4,564	6,620	9,691	9,092	9,604	9,710	44,717
96	0604181C		Hypersonic Defense	04	0	0	75,300	116,300	152,300	137,200	113,000	594,100
		MD29	Hypersonic Defense	04	0	0	75,300	116,300	152,300	137,200	113,000	594,100
105	0604873C		Long Range Discrimination Radar (LRDR)	04	132,278	173,162	357,659	135,187	52,218	50,843	119,803	715,710
		MC96	Cyber Operations	04	5,600	0	0	0	0	0	0	0
		MD96	Long Range Discrim Radar (LRDR)	04	115,619	161,353	341,638	128,689	49,792	48,388	114,071	682,578
		MD40	Program Wide Support	04	11,059	11,809	16,021	6,498	2,426	2,455	5,732	33,132
106	0604874C		Improved Homeland Defense (HLD) Interceptors	04	282,864	274,148	465,530	496,414	532,984	635,749	627,388	2,758,065
		MD97	Improved HD Interceptors	04	270,780	260,543	448,160	472,098	506,467	603,371	596,701	2,626,797
		MD40	Program Wide Support	04	12,084	13,605	17,370	24,316	26,517	32,378	30,687	131,268
107	0604876C		Ballistic Missile Defense Terminal Defense Segment Test	04	20,980	63,444	36,239	68,865	15,667	49,706	51,451	221,928
		MT07	THAAD Test	04	16,344	60,577	33,321	65,555	14,939	47,306	48,989	210,110
		MD40	Program Wide Support	04	4,636	2,867	2,918	3,310	728	2,400	2,462	11,818
108	0604878C		Aegis BMD Test	04	78,468	95,012	134,468	73,059	82,570	113,856	97,660	501,613
		MT09	AEGIS BMD Test	04	76,043	90,953	128,776	69,548	78,734	108,359	92,987	478,404
		MD40	Program Wide Support	04	2,425	4,059	5,692	3,511	3,836	5,497	4,673	23,209
109	0604879C		Ballistic Missile Defense Sensor Test	04	83,597	83,250	84,239	65,886	76,218	68,231	56,579	351,153
		MT11	BMDS Radars Test	04	79,839	78,430	80,837	62,719	72,677	64,937	53,872	335,042
		MD40	Program Wide Support	04	3,758	4,820	3,402	3,167	3,541	3,294	2,707	16,111
110	0604880C		Land Based SM-3 (LBSM3)	04	29,288	43,293	30,486	31,816	33,024	31,707	30,924	157,957
		MD68	AEGIS Ashore	04	27,773	41,548	26,477	29,787	30,990	29,676	28,944	145,874
		MC68	Cyber Operations	04	0	0	2,643	500	500	500	500	4,643
		MD40	Program-Wide Support	04	1,515	1,745	1,366	1,529	1,534	1,531	1,480	7,440
111	0604881C		AEGIS SM-3 Block IIA Co-Development	04	165,456	106,038	9,739	0	0	0	0	9,739
		MD09	SM-3 Block IIA Co-Development	04	132,677	91,071	8,816	0	0	0	0	8,816
		MT09	SM-3 Block IIA Co-Development Test	04	25,186	12,208	0	0	0	0	0	0
		MD40	Program-Wide Support	04	7,593	2,759	923	0	0	0	0	923
112	0604887C		Ballistic Missile Defense Midcourse Defense Segment Test	04	54,619	56,481	76,757	74,205	69,713	77,826	79,094	377,595
		MT08	Midcourse Test	04	51,821	53,192	73,453	70,638	66,474	74,069	75,309	359,943
		MD40	Program Wide Support	04	2,798	3,289	3,304	3,567	3,239	3,757	3,785	17,652
113	0604894C		Multi Object Kill Vehicle	04	0	71,513	6,500	3,500	229,524	209,830	265,898	715,252
		MD85	Multi Object Kill Vehicle	04	0	68,201	6,500	3,500	225,755	205,048	261,062	701,865
		MD40	Program-Wide Support	04	0	3,312	0	0	3,769	4,782	4,836	13,387
116	1206893C		Space Tracking and Surveillance System (STSS)	04	0	0	34,907	39,453	37,583	36,893	37,726	186,562
		MD12	Space Tracking and Surveillance System (STSS)	04	0	0	32,015	32,597	34,256	34,780	35,489	169,137
		MC12	Cyber Operations	04	0	0	1,336	4,968	1,592	343	443	8,682
		MD40	Program-Wide Support	04	0	0	1,556	1,888	1,735	1,770	1,794	8,743
117	1206895C		Ballistic Missile Defense System Space Programs	04	0	0	16,994	13,348	14,395	17,278	17,726	79,741
		MD33	MD Space Exp Center (MDSEC)	04	0	0	16,233	12,706	13,726	16,444	16,878	75,987
		MD40	Program-Wide Support	04	0	0	761	642	669	834	848	3,754

Missile Defense Agency
President's Budget (PB) 2018-2022
FY 2018- FY 2022 Appropriation Summary
R-1 Exhibit
(\$ Thousands)

Line Number	Program Element	Budget Project	Program	Budget Activity	FY16 Actual	FY17	FY18	FY19	FY20	FY21	FY22	FY18-22
Budget Activity 04 Total				04	5,898,841	5,733,708	5,879,210	5,378,951	5,949,864	5,963,169	6,074,980	29,246,174
155	0605502C		Small Business Innovation Research - MDA	06	88,694	0	0	0	0	0	0	0
		MD45	Small Business Innovation Research	06	88,694	0	0	0	0	0	0	0
184	0901598C		Management HQ - MDA	06	35,871	31,160	29,947	28,024	27,269	27,878	28,450	141,568
		MD38	Management Headquarters	06	35,871	31,160	29,947	28,024	27,269	27,878	28,450	141,568
Budget Activity 06 Total				06	124,565	31,160	29,947	28,024	27,269	27,878	28,450	141,568
RDT&E Total				06	6,210,652	5,969,695	6,200,711	5,762,586	6,124,670	6,028,302	6,142,152	30,258,421
MILCON												
	0603882C		MID-COURSE MILCON	NA	0	9,560	0	0	0	0	0	0
		MM08	Missile Defense Complex Switchgear Facility, Ft. Greely, AK	NA	0	9,560	0	0	0	0	0	0
	0603884C		SENSORS MILCON	NA	0	166,670	0	150,000	0	212,000	0	362,000
		MM04	Wake Island Air Base Test Support Facility, Wake Is	NA	0	11,670	0	0	0	0	0	0
		MM96	Long Range Discriminating Radar (LRDR)	NA	0	155,000	0	0	0	0	0	0
		MM41	MRDR Pacific Radar	NA	0	0	0	0	0	212,000	0	212,000
		MM11	Long Range Discrimination Radar Cmplx, Clear AFS, AK	NA	0	0	0	150,000	0	0	0	150,000
	0603888C		BMD TEST and TARG MILCON	NA	0	0	0	0	0	0	177,900	177,900
		MM44	BMDS Test Infrastructure Building (BTB)	NA	0	0	0	0	0	0	177,900	177,900
	0604880C		LAND-BASED SM-3 (LBSM3) - MILCON	NA	169,153	0	0	0	0	0	0	0
		MM68	AEGIS Ashore - MILCON	NA	169,153	0	0	0	0	0	0	0
	22299902		MINOR MILCON	NA	0	2,414	3,000	3,000	3,000	3,000	3,000	15,000
		MM14	Minor MILCON	NA	0	2,414	3,000	3,000	3,000	3,000	3,000	15,000
	31299903		MILCON PLANNING and DESIGN	NA	15,000	0	0	15,184	36,140	16,248	8,009	75,581
		MM32	MILCON Planning Design	NA	15,000	0	0	15,184	36,140	16,248	8,009	75,581
Budget Activity 00 Total				NA	184,153	178,644	3,000	168,184	39,140	231,248	188,909	630,481
MILCON Total				NA	184,153	178,644	3,000	168,184	39,140	231,248	188,909	630,481
Program Total					8,306,958	7,755,117	7,886,133	8,003,535	8,221,938	8,326,241	8,461,044	40,898,891

Missile Defense Agency Congressional Reporting Requirements

Reporting Requirement Reference	Reporting Requirement Language	Budget Documentation
<p>Sec. 1679 of the FY16 National Defense Authorization Act (HR 1735), pp. 1041-1046</p>	<p>SEC. 1679. ISRAELI COOPERATIVE MISSILE DEFENSE PROGRAM CODEVELOPMENT AND COPRODUCTION</p> <p>(a) IN GENERAL.—Subject to subsection (b), of the funds authorized to be appropriated for fiscal year 2016 for procurement, Defense-wide, and available for the Missile Defense Agency—</p> <p>(1) not more than \$150,000,000 may be provided to the Government of Israel to procure the David’s Sling Weapon System, including for coproduction of parts and components in the United States by United States industry; and</p> <p>(2) not more than \$15,000,000 may be provided to the Government of Israel for the Arrow 3 Upper Tier Interceptor Program, including for coproduction of parts and components in the United States by United States industry.</p> <p>(b) CERTIFICATION.—</p> <p>(1) CRITERIA.—Except as provided by subsection (c), the Under Secretary of Defense for Acquisition, Technology, and Logistics shall submit to the appropriate congressional committees a certification that—</p> <p>(A) the Government of Israel has demonstrated the successful completion of the knowledge points, technical milestones, and production readiness reviews required by the research, development, and technology agreements for the David’s Sling Weapon System and the Arrow 3 Upper Tier Development Program, respectively;</p> <p>(B) such funds will be provided on the basis of a one-for-one cash match made by Israel for such respective systems or in another matching amount that otherwise meets best efforts (as mutually agreed to by the United States and Israel);</p> <p>(C) the United States has entered into a bilateral agreement with Israel that establishes—</p> <p>(i) in accordance with subparagraph (D), the terms of coproduction of parts and components of such respective systems on the basis of the greatest practicable coproduction of parts, components, and all up rounds (if appropriate) by United States industry and minimizes nonrecurring engineering and facilitization expenses;</p> <p>(ii) complete transparency on the requirement of Israel for the number of interceptors and batteries of such respective systems that will be procured, including with respect to the procurement plans, acquisition strategy, and funding profiles of Israel;</p> <p>(iii) technical milestones for coproduction of parts and components and procurement of such respective systems; and</p> <p>(iv) joint approval processes for third party sales of such respective systems and the components of</p>	<p>Submitted with the FY2017 Budget Release</p>

Missile Defense Agency Congressional Reporting Requirements

such respective systems; and

(D) the level of coproduction described in subparagraph (C)(i) for the David’s Sling Weapon System is equal to or greater than 50 percent.

(2) NUMBER.—In carrying out paragraph (1), the Under Secretary may submit—

(A) one certification covering both the David’s Sling Weapon System and the Arrow 3 Upper Tier Interceptor Program; or

(B) separate certifications for each such respective system.

(3) TIMING.—The Under Secretary shall submit to the congressional defense committees the certification under paragraph (1) by not later than 60 days before the funds specified in subsection (a) for the respective system covered by the certification are provided to the Government of Israel.

(c) WAIVER.—The Under Secretary may waive the certification required by subsection (b) if the Under Secretary certifies to the appropriate congressional committees that the Under Secretary has received sufficient data from the Government of Israel to demonstrate—

(1) the funds specified in paragraph (1) and (2) of subsection (a) are provided to Israel solely for funding the procurement of long-lead components in accordance with a production plan, including a funding profile detailing Israeli contributions for production, including long-lead production, of either David’s Sling Weapon System or the Arrow 3 Upper Tier Interceptor Program;

(2) such long-lead components have successfully completed knowledge points, technical milestones, and production readiness reviews; and

(3) the long-lead procurement will be conducted in a manner that maximizes coproduction in the United States without incurring additional nonrecurring engineering activity or cost.

(d) PLAN ON COPRODUCTION OF DAVID’S SLING WEAPON SYSTEM.—At the same time that the President submits to Congress the budget for fiscal year 2017 under section 1105(a) of title 31, United States Code, the Director of the Missile Defense Agency and the Under Secretary shall jointly submit to the appropriate congressional committees a plan to achieve a rate of coproduction by United States industry of parts and components of the David’s Sling Weapon System at a level that is not less than 50 percent. Such plan shall include—

(1) a timeline for achieving such a level of coproduction;

(2) any nonrecurring engineering or facilitization costs related to such coproduction, costs for additional testing and training, and other additional associated costs;

(3) a recommendation for whether carrying out such plan is in the national interest of the United States; and

(4) any other matter the Director and Under Secretary consider appropriate.

Missile Defense Agency Congressional Reporting Requirements		
	<p>(e) APPROPRIATE CONGRESSIONAL COMMITTEES DEFINED.—In this section, the term “appropriate congressional committees” means the following:</p> <p>(1) The congressional defense committees.</p> <p>(2) The Committee on Foreign Affairs of the House of Representatives and the Committee on Foreign Relations of the Senate.</p>	
<p>Sec. 1681 of the FY16 National Defense Authorization Act (HR 1735), pp. 1050-1052</p>	<p>SEC. 1681. DEVELOPMENT AND DEPLOYMENT OF MULTIPLE-OBJECT KILL VEHICLE FOR MISSILE DEFENSE OF THE UNITED STATES HOMELAND</p> <p>(a) It is the sense of Congress that—</p> <p>(1) the defense of the United States homeland against the threat of limited ballistic missile attack (whether accidental, unauthorized, or deliberate) is the highest priority of the Missile Defense Agency;</p> <p>(2) the Missile Defense Agency is appropriately prioritizing the design, development, and deployment of the redesigned kill vehicle; and</p> <p>(3) the multiple-object kill vehicle could contribute critical capabilities to the future of the ballistic missile defense of the United States homeland.</p> <p>(b) MULTIPLE-OBJECT KILL VEHICLE.—</p> <p>(1) DEVELOPMENT.—The Director of the Missile Defense Agency shall develop a highly reliable multiple-object kill vehicle for the ground-based midcourse defense system using sound acquisition practices.</p> <p>(2) DEPLOYMENT.—The Director shall—</p> <p>(A) conduct rigorous flight testing of the multiple-object kill vehicle developed under paragraph (1) by not later than 2020; and</p> <p>(B) recognizing the primacy of developing the redesigned kill vehicle, produce and deploy the multiple-object kill vehicle as early as practicable after the date on which the Director carries out subparagraph (A).</p> <p>(c) CAPABILITIES AND CRITERIA.—The Director shall ensure that the multiple-object kill vehicle developed under subsection (b)(1) meets, at a minimum, the following capabilities and criteria:</p> <p>(1) Vehicle-to-vehicle communications.</p> <p>(2) Vehicle-to-ground communications.</p> <p>(3) Kill assessment capability.</p> <p>(4) The ability to counter advanced countermeasures, decoys, and penetration aids.</p> <p>(5) Producibility and manufacturability.</p>	<p>Submitted with the FY2017 Budget Release in PE 0603178C (Weapons Technology) and PE 0604894C (Multi Object Kill Vehicle)</p>

Missile Defense Agency Congressional Reporting Requirements

	<p>(6) Use of technology involving high technology readiness levels.</p> <p>(7) Options to be integrated onto other missile defense interceptor vehicles other than the ground based interceptors of the ground-based midcourse defense system.</p> <p>(8) Sound acquisition processes.</p> <p>(d) PROGRAM MANAGEMENT.—The management of the multiple-object kill vehicle program under subsection (b) shall report directly to the Deputy Director of the Missile Defense Agency.</p> <p>(e) REPORT ON FUNDING PROFILE.—The Director shall include with the budget justification materials submitted to Congress in support of the budget of the Department of Defense for fiscal year 2017 (as submitted with the budget of the President under section 1105(a) of title 31, United States Code) a report on the funding profile necessary for the multiple-object kill vehicle program to meet the objectives under subsection (b).</p>	
<p>Sec. 1684 of the FY16 National Defense Authorization Act (HR 1735), pp. 1056-1059</p>	<p>SEC. 1684. ADDITIONAL MISSILE DEFENSE SENSOR COVERAGE FOR PROTECTION OF UNITED STATES HOMELAND</p> <p>(a) It is the sense of Congress that additional missile defense sensor discrimination capabilities are needed to enhance the protection of the United States homeland against potential long-range ballistic missiles from Iran that, according to the Department of Defense, could soon be obtained by Iran as a result of its active space launch program.</p> <p>(b) STUDIES AND EVALUATIONS ON HOMEPORT OF SEA-BASED X-BAND RADAR.— Not later than 60 days after the date of the enactment of this Act, the Director of the Missile Defense Agency shall commence any siting studies, environmental impact assessments or statements required pursuant to the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) that have not otherwise been prepared, homeport agreements for sea-based X-band radar support, evaluations of any needed pier modifications, and evaluations of any communications capabilities or other requirements to carry out the reassignment of the homeport of the sea-based X-band radar to a homeport on the East Coast of the United States.</p> <p>(c) POTENTIAL FUTURE MISSILE DEFENSE SENSOR SITES.—</p> <p>(1) EVALUATION.—Not later than March 31, 2016, the Director shall commence a study to evaluate at least three possible additional locations (in or outside the United States), selected by the Director, that would be best suited for future deployment of an advanced missile defense sensor site optimized against threats from Iran.</p>	<p>Submitted in the FY2017 Budget Justification Materials in PE 0603890C (BMD Enabling Programs) and PE 0603884C (BMD Sensors)</p>

Missile Defense Agency Congressional Reporting Requirements

	<p>(2) ENVIRONMENTAL IMPACT STATEMENTS.— Except as provided by paragraph (3), the evaluation under paragraph (1) shall include an environmental impact statement or other analysis in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) for each location included in the evaluation.</p> <p>(3) EXCEPTION.—If an environmental impact statement or other analysis described in paragraph (2) has already been prepared, or is not required by law, for a location included in the evaluation under paragraph (1), the Director shall not be required to carry out paragraph (2) with respect to such location.</p> <p>(d) DEPLOYMENT OF ADDITIONAL COVERAGE.— (1) DEPLOYMENT.—Not later than December 31, 2020, the Director, in cooperation with the relevant combatant command, shall deploy a long-range discrimination radar or other appropriate sensor capability in a location optimized to support the defense of the homeland of the United States from emerging long-range ballistic missile threats from Iran.</p> <p>(2) SEA-BASED X-BAND RADAR.—If the Director carries out paragraph (1) by reassigning the homeport of the sea-based X-band radar, the Director and the Secretary of the Navy may not carry out such reassignment until the date on which the Director certifies to the congressional defense committees that Hawaii will have adequate missile defense coverage prior to such reassignment.</p> <p>(e) SUBMISSION OF INFORMATION.—</p> <p>(1) REPORT.—Not later than December 31, 2018, the Director shall submit to the congressional defense committees a report containing the following:</p> <p>(A) The findings of the study conducted under paragraph (1) of subsection (c), including any environmental impact statements or analyses required by paragraph (2) of such subsection.</p> <p>(B) Notification of the manner in which Hawaii is being provided ballistic missile defense coverage.</p> <p>(2) PLAN.—In the budget justification materials submitted to Congress in support of the budget for each of fiscal years 2017 through 2020 submitted by the President to Congress under section 1105 of title 31, United States Code, the Director shall include—</p> <p>(A) the plan of the Director to carry out subsection (d); and</p> <p>(B) an update on the progress of the Director in implementing subsections (b) and (c).</p>	
<p>Sec 231 of the FY14 National Defense Authorization Act (HR 3304, TITLE II – Subtitle C),</p>	<p>SEC 231. IMPROVEMENTS TO ACQUISITION ACCOUNTABILITY REPORTS ON BALLISTIC MISSILE DEFENSE SYSTEM</p> <p>(a) Improvement to Operations and Sustainment Cost Estimates- In preparing the acquisition accountability reports on the ballistic missile defense system required by section 225 of title 10,</p>	<p>MDA to provide BMDS Accountability Report (BAR) to Congressional Defense Committees. The BAR fully satisfies the requirement.</p>

Missile Defense Agency Congressional Reporting Requirements

<p>pp. 18</p>	<p>United States Code, the Director of the Missile Defense Agency shall improve the quality of cost estimates relating to operations and sustainment that are included in such reports under subsection (b)(3)(A) of such section, including with respect to the confidence levels of such cost estimates.</p> <p>(b) Operations and Sustainment Responsibility- Section 225 of title 10, United States Code, is amended by adding at the end the following new subsection:</p> <p>(e) Operations and Sustainment Cost Estimates- The Director shall ensure that each life-cycle cost estimate included in an acquisition baseline pursuant to subsection (b)(3)(A) includes--</p> <p>(1) all of the operations and sustainment costs for which the Director is responsible; and</p> <p>(2) a description of the operations and sustainment functions and costs for which a military department is responsible.'</p> <p>(c) Report-</p> <p>(1) IN GENERAL- Not later than one year after the date of the enactment of this Act, the Director of the Missile Defense Agency shall submit to the congressional defense committees a report outlining the plans of the Director to improve the quality of cost estimates pursuant to subsection (a).</p> <p>(2) ELEMENTS- The report under paragraph (1) shall include--</p> <p>(A) a description of the actions planned to improve the quality of cost estimates included in the acquisition accountability reports on the ballistic missile defense system required by section 225 of title 10, United States Code;</p> <p>(B) the schedule for such planned actions, including the planned schedule for meeting the requirements of subsection (e) of such section 225, as added by subsection (b);</p> <p>(C) a description of any steps taken during the previous year to improve the quality of such cost estimates;</p> <p>(D) an assessment of how the planned improvements compare to the best practices and cost-estimation guidelines recommended by the Comptroller General of the United States for cost estimates of the ballistic missile defense system;</p> <p>(E) any other matters the Director considers appropriate; and</p> <p>(F) the views of the Comptroller General of the United States with respect to the contents of the report.</p> <p>(3) FORM- The report under paragraph (1) shall be submitted in unclassified form.</p>	
<p>Sec 234 of H.R. 1960 H. Rpt 113-02, FY14 House Armed Services Committee Report, pp. 67-68</p>	<p>REPORT ON IMPROVEMENTS TO ACQUISITION ACCOUNTABILITY REPORTS ON BALLISTIC MISSILE DEFENSE SYSTEM</p> <p>This section would amend section 225 of title 10, United States Code, to include a requirement that the Director, Missile Defense Agency include in the annual Ballistic Missile Defense System Accountability Report certain operation and support costs, and statements as to the quality estimate</p>	<p>MDA to provide BMDS Accountability Report (BAR) to Congressional Defense Committees. The BAR fully satisfies the requirement.</p>

Missile Defense Agency Congressional Reporting Requirements

	<p>level of each cost estimate as well as the steps the Director will take to ensure these estimates reach the “high-quality estimate” level established by the Comptroller General of the United States.</p> <p>(a) In General.—Section 225 of title 10, United States Code, is amended—</p> <p style="padding-left: 40px;">(1) in subsection (b)(3)(A), by inserting “comprehensive” before “life-cycle”; and</p> <p style="padding-left: 40px;">(2) by adding at the end the following:</p> <p style="padding-left: 40px;">(e) Quality of Cost Estimates.—(1) The Director shall ensure that each cost estimate included in an acquisition baseline pursuant to subsection (b)(3) includes all operation and support costs, regardless of funding source, for which the Director is responsible.</p> <p style="padding-left: 40px;">(2) In each such baseline submitted to the congressional defense committees, the Director shall state whether the underlying cost estimates in such baseline meet the criteria of the Comptroller General of the United States to be considered a high-quality estimate. If the Director states that such estimates do not meet such criteria, the Director shall include in such baseline the actions, including a schedule, that the Director plans to carry out for the estimates to meet such criteria.”.</p>	
<p>Sec 231 of the FY12 National Defense Authorization Act (S 1867, TITLE II – Subtitle C), pp. 53-54</p>	<p>SEC. 231. ACQUISITION ACCOUNTABILITY REPORTS ON THE BALLISTIC MISSILE DEFENSE SYSTEM</p> <p>(a) BASELINE REQUIRED.—</p> <p>(1) IN GENERAL.—Chapter 9 of title 10, United States Code, is amended by inserting after section 224 the following new section: 225. Acquisition accountability reports on the ballistic missile defense system</p> <p>(a) BASELINES REQUIRED.—(1) In accordance with paragraph (2), the Director of the Missile Defense Agency shall establish and maintain an acquisition baseline for—</p> <p style="padding-left: 40px;">(A) each program element of the ballistic missile defense system, as specified in section 223 of this title; and</p> <p style="padding-left: 40px;">(B) each designated major subprogram of such program elements.</p> <p>(2) The Director shall establish an acquisition baseline required by paragraph (1) before the date on which the program element or major subprogram enters—</p> <p style="padding-left: 40px;">(A) engineering and manufacturing development; and</p> <p style="padding-left: 40px;">(B) production and deployment.</p> <p>(3) Except as provided by subsection (d), the Director may not adjust or revise an acquisition baseline established under this section.</p> <p>(b) ELEMENTS OF BASELINES.—Each acquisition baseline required by subsection (a) for a program element or major subprogram shall include the following:</p> <p style="padding-left: 40px;">(1) A comprehensive schedule, including—</p>	<p>MDA to provide BMDS Accountability Report (BAR) to Congressional Defense Committees. The BAR fully satisfies the requirement.</p>

Missile Defense Agency Congressional Reporting Requirements

- (A) research and development milestones;
- (B) acquisition milestones, including design reviews and key decision points;
- (C) key test events, including ground and flight tests and ballistic missile defense system tests;
- (D) delivery and fielding schedules;
- (E) quantities of assets planned for acquisition and delivery in total and by fiscal year; and
- (F) Planned contract award dates.
- (2) A detailed technical description of—
 - (A) the capability to be developed, including hardware and software;
 - (B) system requirements, including performance requirements;
 - (C) how the proposed capability satisfies a capability identified by the commanders of the combatant commands on a prioritized capabilities list;
 - (D) key knowledge points that must be achieved to permit continuation of the program and to inform production and deployment decisions; and
 - (E) how the Director plans to improve the capability over time.
- (3) A cost estimate, including—
 - (A) a life-cycle cost estimate that separately identifies the costs regarding research and development, procurement, military construction, operations and sustainment, and disposal;
 - (B) program acquisition unit costs for the program element;
 - (C) average procurement unit costs and program acquisition costs for the program element; and
 - (D) an identification of when the document regarding the program joint cost analysis requirements description is scheduled to be approved.
- (4) A test baseline summarizing the comprehensive test program for the program element or major subprogram outlined in the integrated master test plan.
- (c) ANNUAL REPORTS ON ACQUISITION BASELINES.—
 - (1) Not later than February 15 of each year, the Director shall submit to the congressional defense committees a report on the acquisition baselines required by subsection (a).
 - (2)(A) The first report under paragraph (1) shall set forth each acquisition baseline required by subsection (a) for a program element or major subprogram.
 - (3) Each subsequent report under paragraph (1) shall include—
 - (i) any new acquisition baselines required by subsection (a) for a program element or major subprogram; and
 - (ii) with respect to an acquisition baseline that was previously included in a report under paragraph (1), an identification of any changes or variances made to the elements described in subsection (b) for such acquisition baseline, as compared to—
 - (I) the initial acquisition baseline for such program element or major subprogram; and
 - (II) the acquisition baseline for such program element or major subprogram that was submitted in

Missile Defense Agency Congressional Reporting Requirements

	<p>the report during the previous year.</p> <p>(3) Each report under this subsection shall be submitted in unclassified form, but may include a classified annex.</p> <p>(d) EXCEPTION TO LIMITATION ON REVISION.—The Director may adjust or revise an acquisition baseline established under this section if the Director submits to the congressional defense committees notification of—</p> <p>(1) a justification for such adjustment or revision;</p> <p>(2) the specific adjustments or revisions made to the acquisition baseline, including to the elements described in subsection (b); and</p> <p>(3) the effective date of the adjusted or revised acquisition baseline.’’.</p> <p>(2) CLERICAL AMENDMENT.—The table of sections at the beginning of such chapter is amended by adding at the end the following new item: section 225. Acquisition accountability reports on the ballistic missile defense system.’’.</p> <p>(b) CONFORMING AMENDMENTS.—</p> <p>(1) FISCAL YEAR 2011 NDAA.—Section 225 of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011 (Public Law 111–383; 124 Stat. 4170; 10 U.S.C. 223 note) is repealed.</p> <p>(2) FISCAL YEAR 2008 NDAA.—Section 223 of the National Defense Authorization Act for Fiscal Year 2008 (Public Law 110–181; 122 Stat. 39; 10 U.S.C. 223 note) is amended by striking subsection (g).</p> <p>(3) FISCAL YEAR 2003 NDAA.—Section 221 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003 (Public Law 107–314; 116 Stat. 2484; 10 U.S.C. 2431 note) is repealed.</p>	
<p>FY12 National Defense Authorization Act, Report Language – House Report 112-239 (Subtitle C Missile Defense Matters), pp. 43-44</p>	<p>SEC. 232. COMPTROLLER GENERAL REVIEW AND ASSESSMENT OF MISSILE DEFENSE ACQUISITION PROGRAMS</p> <p>(a) Comptroller General Assessment—</p> <p>(1) IN GENERAL- The Comptroller General of the United States shall review the annual reports submitted under section 225(c) of title 10, United States Code, as added by section 231 of this Act, that cover any of fiscal years 2012 through 2015 and assess the extent to which the Missile Defense Agency has achieved its acquisition goals and objectives.</p> <p>(2) REPORTS- Not later than March 15, 2013, and each year thereafter through 2016, the Comptroller General shall submit to the congressional defense committees a report on the assessment under paragraph (1) with respect to the acquisition baselines for the preceding fiscal year. Each report shall include any findings and recommendations on missile defense acquisition programs and accountability therefore that the Comptroller General considers appropriate.</p>	<p>MDA to provide BMDS Accountability Report (BAR) to Congressional Defense Committees. The BAR fully satisfies the requirement.</p>

Missile Defense Agency Congressional Reporting Requirements

	<p>(b) Annual Reports on Missile Defense Executive Board Activities- In each of the first three reports submitted under section 225(c) of title 10, United States Code, as added by section 231 of this Act, the Director shall include a description of the activities of the Missile Defense Executive Board during the fiscal year preceding the date of the report, including the following:</p> <ol style="list-style-type: none"> (1) A list of each meeting of the Board during such year. (2) The agenda and issues considered at each such meeting. (3) A description of any decisions or recommendations made by the Board at each such meeting. <p>(c) Repeal of Superseded Reporting Authority- Section 232 of the National Defense Authorization Act for Fiscal Year 2002 (Public Law 107-107; 115 Stat. 1037; 10 U.S.C. 2431 note) is amended by striking subsection (g).</p>	
<p>Sec. 1688 of the FY16 National Defense Authorization Act (HR 1735), pp. 1065</p>	<p>SEC. 1688. EXTENSION OF REQUIREMENT FOR COMPTROLLER GENERAL OF THE UNITED STATES REVIEW AND ASSESSMENT OF MISSILE DEFENSE ACQUISITION PROGRAMS Section 232(a) of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112–81; 125 Stat. 1339) is amended—</p> <ol style="list-style-type: none"> (1) in paragraph (1), by striking “through 2015” and inserting “through 2020”; and (2) in paragraph (2), in the first sentence, by striking “through 2016” and inserting “through 2021”. 	<p>MDA to provide BMDS Accountability Report (BAR) to Congressional Defense Committees. The BAR fully satisfies the requirement.</p>
<p><i>Sec 223(a). Ballistic Missile Defense Programs: Procurement;</i> National Defense Authorization Act for Fiscal Year 2004 (H.R. 1588, H. Rpt. 108-354), pp. 30-31</p>	<p>BUDGET JUSTIFICATION MATERIALS</p> <p>In the budget justification materials submitted to Congress in support of the Department of Defense budget for any fiscal year (as submitted with the budget of the President under section 1105(a) of title 31), the Secretary of Defense shall specify, for each ballistic missile defense system element for which the Missile Defense Agency is engaged in planning for production and initial fielding, the following information: (1) The production rate capabilities of the production facilities planned to be used for production of that element. (2) The potential date of availability of that element for initial fielding. (3) The estimated date on which the administration of the acquisition of that element is to be transferred from the Director of the Missile Defense Agency to the Secretary of a military department.</p>	<p>MDA to provide BMDS Accountability Report (BAR) to Congressional Defense Committees. The BAR partially satisfies the requirement through its schedule baseline.</p> <p>Exhibit P-21 – Budget Production Schedule</p> <p>Procurement -MDA 0208866C, Terminal Defense, 0208866C, Aegis BMD,</p>

Missile Defense Agency Congressional Reporting Requirements

		<p>0208866C, Aegis Ashore Phase III</p> <p>0208866C, BMDS AN/TPY-2 Radars</p> <p>0208866C Iron Dome</p>
<p><i>Sec 223(b). Ballistic Missile Defense Programs: Procurement; National Defense Authorization Act for Fiscal Year 2004 (H.R. 1588, H. Rpt. 108-354, pp. 30-31)</i></p>	<p>FUTURE-YEARS DEFENSE PROGRAM</p> <p>The Secretary of Defense shall include in the future-years defense program submitted to Congress each year under section 221 of this title an estimate of the amount necessary for procurement for each ballistic missile defense system element, together with a discussion of the underlying factors and reasoning justifying the estimate.</p>	<p>Procurement -MDA 0208866C, Terminal Defense,</p> <p>0208866C, Aegis BMD,</p> <p>0208866C, Aegis Ashore Phase III</p> <p>0208866C, BMDS AN/TPY-2 Radars</p> <p>0208866C, Iron Dome</p>

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

PART SUMMARY

Missile Defense

Mission:

To Develop and deploy a layered BMDS to defend the United States, its deployed forces, allies and friends from ballistic missile attacks of all ranges in all phases of flight.

In accordance with the President's Management Agenda, Budget and Performance Integration Initiative, this program has been assessed using the Program Assessment Rating Tool (PART). Remarks regarding program performance and plans for performance improvement can be located at the Expectmore.gov website –

<http://www.whitehouse.gov/sites/default/files/omb/assets/omb/expectmore/index.html>

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

Missile Defense Agency
Fiscal Year (FY) 2018 President's Budget Review

ACRONYMS AND ABBREVIATIONS

A	
A&AS	Advisory and Assistance Services
AAEA	Aegis Ashore Engineering Agent
AAFTM	Aegis Ashore Flight Test Mission
AAMDS	Aegis Ashore Missile Defense System
AAMDSC	Aegis Ashore Missile Defense System Complex
AAMDTC	Aegis Ashore Missile Defense Test Complex
AAW	Anti-Air Warfare
ABEWS	Airborne Early Warning System
ABIR	Airborne Infrared Radar
ABMD	Aegis Ballistic Missile Defense
ABS	Airborne Sensors; American Bureau of Shipping
ABWO	Assistant Ballistic Missile Defense Watch Officer
ACB	Advanced Capability Build
ACB 12	Advanced Capability Build 12
ACD	Adversary Capability Document
ACD&P	Advanced Component Development & Prototypes
ACL	Achievable Capabilities List
ACS	Aegis Combat System
ADP	Arrow Deployability Program; Automated Data Processing; Adversary Delta Package
AEDC	Arnold Engineering Development Center
AEI	Annual Integration Events
AEP	Analysis Execution Plans
AEU	Antenna Equipment Unit
AFB	Air Force Base
AFS	Avionics Flight Software
AI&T	Assembly, Integration and Test
AIE	Annual Integration Event
ALO	Aegis Light-Off
ALTB	Active Layered Theater Ballistic
AMCOM	Army Aviation and Missile Command
AMDR	Air and Missile Defense Radar
AMDWS	Air and Missile Defense Workstation
AMOD	Aegis Modernization (program)
AMRDEC	Aviation and Missile Research, Development and Engineering Center
AN/SPY-1	Joint Army-Navy equipment nomenclature: S -Water (surface ship), P - Radar, Y - Surveillance (target detecting and tracking) and Control (fire control and/or air control), 1 - model number [AN/SPY-1 is an equipment nomenclature, not an Acronym]
AN/TPY	Army Navy/Transportable Radar Surveillance
AN/TPY-2	Joint Army-Navy equipment nomenclature: T - Transportable (ground), P - Radar, Y - Surveillance (target detecting and tracking) and Control (fire control and/or air control), 2 - model number [AN/TPY-2 is an equipment nomenclature, not an Acronym]
AOA	Analyses of Alternatives
AOC	Air Operations Center
AOR	Area of Responsibility
APEX	Assessment Parameter Extraction
APL	Applied Physics Laboratory
APLITS	Approved Product List
ARAV	Aegis Readiness Assessment Vehicles
ARST	Advanced Remote Sensor Technology
ARSTRST	(US) Army Forces Strategic Command
ASIP	Arrow System Improvement Program; Application Specific Integrated Circuit
AT&L	Acquisition, Technology and Logistics
ATD	Advanced Technology Development; Assistant to the Director

ACRONYMS AND ABBREVIATIONS

ATEC	Army Test and Evaluation Command
ATK	Alliant Techsystems, Inc
AUR	All Up Round
AWS	Arrow Weapon System; AEGIS Weapon System
B	
BCA	Business Case Analysis; BMDS Capability Assessment
BCF	BCF Solutions, Incorporated
BCM	C2BMC model
BCN	BMDS Communications Network
BCSC-T	BMDS Communication System Complex Transportable
BDR	BMDS Discrepancy Reports
BER	Baseline Execution Reviews
BM	Battle Management; Ballistic Missile
BMD	Ballistic Missile Defense
BMDS	Ballistic Missile Defense System
BNOSC	BMDS Network Operations and Security Center
BOA	BMDS Overhead Non-imaging Infrared (ONIR) Architecture
BoD	Boards of Director
BORRS	BMDS Operational Readiness Reporting System
BOS	Base Operations Support
BSA	Budget Sub-Activity
BSC	Battery Support Center
BSO	BMDS Safety Officers
BSP	BMD Signal Processor
BTG	BCN Teleport Gateway
BWO	BMDS Watch Officers
C	
C&A	Certification and Accreditation
C&DSim	Command and Decision Simulation
C/FFP	Cost Fixed Firm Price
C2BMC	Command and Control, Battle Management, and Communications
C2P	Command and Control Processor
C4I	Command, Control, Communications, Computers and Intelligence
CAFM	Computer-aided Facilities Management
CARD	Cost Analysis and Requirements Document
CBAU	Consolidated Booster Avionics Upgrade
CCAS	Combat Capabilities Assessment Schedule
CCC	C2BMC Control Center
CCLS	Centralized Contractor Logistics Support
CCM	Counter Counter-Measures
CCMD	Combatant Commander
CD	Concept Descriptions; Cobra Dane
CDCS	Coherent Doppler Collection System
CDIN	C2BMC Deployable Interface Node
CDLMS	Common Data Link Monitoring System
CDR	Critical Design Review
CDU	Cobra Dane Upgrade
CE	Capability Enhanced
CEC	Critical Engagement Condition
CECOM	US Army Communications & Electronics Command
CENAU	Corps of Engineers European Division
CENTCOM	Central Command
CERT	Computer Emergency Response Team
CEU	Cooling Equipment Unit
CG	US Navy ship hull classification symbol for - Guided Missile Cruiser [CG is not an Acronym]

ACRONYMS AND ABBREVIATIONS

CIC	Counterintelligence in Cyberspace
CIDS	Critical Items Description Specifications
CIIA	Cyber, Identity, and Information Assurance
CIRT	Computer Incident Response Team
CLE	Command and Launch Equipment
CLS	Contractor Logistics Support
CND	Computer Network Defense
CNET	Classified Network
COCOM	Combatant Commanders
COMNET	communications network
COMSEC	Communication Security
CONOPS	Concept of Operations
CONPLAN	Concept Plan
CONPLANS	Contingency Plans
CONUS	Continental United States
COOP	Calibrated Orbiting Objects Program (COOP)
CoS	Colorado Springs
COTS	Commercial off the Shelf
CP	Computer Program
CPAF	Cost Plus Award Fee
CPCR	Computer Program Change Request
CPFF	Cost Plus Fixed Fee
CPIF	Cost-Plus-Incentive-Fee
CPRS	Computer Program Requirements Specifications
CR	Capability Release
CSC	Computer Sciences Corporation
CSCS	Center for Surface Combat Systems
CSEDS	Combat Systems Engineering Development Site
CSS	Contractor Support Services
CTM	Core Truth Models
CTTO	Concurrent Test, Training and Operations
CTV	Control Test Vehicle
CTV-01	Controlled Test Vehicle-01
CU	Capability Upgrade
CVT	Controls Validation Testing
CY	Calendar Year
D	
DAA	Designated Approving Authority
DAA	Defense Appropriations Act; Designated Approving Authority
DAC	Divert Attitude Control
DACS	Divert and Attitude Control System
DARPA	Defense Advanced Research Projects Agency
DASA	German Aerospace. Member of the MEADS Program Team.
DAU	Defense Acquisition University
DDCS	Digital Data Collection System
DDG	US Navy ship hull classification symbol for - Guided Missile Destroyer [DDG is not an Acronym]
DECC	Defense Enterprise Computing Center
DEERS	Defense Enrollment Eligibility Reporting System
DESH	MDA/DESH - Missile Defense Agency (MDA)/Modeling & Simulation Huntsville (DESH) [office symbol within MDA Engineering Directorate, not an Acronym]
DESIM	Discrete Event Simulation
DFAR	Defense Federal Acquisition Regulation
DHP	Data Handling Plan
DIA	Defense Intelligence Agency
DIACAP	DoD Information Assurance Certification and Accreditation Process; DoD Information Assurance Certification and Accreditation Program

ACRONYMS AND ABBREVIATIONS

DIACAP	DoD Information Assurance Certification and Accreditation Process
DISA	Defense Information Systems Agency
DMETS	Distributed, Multi-Echelon Training System
DMIC	Digital M&S Integration Center
DMS	Diminished Manufacturing Support
DoD	Department of Defense
DoDi	DoD Information Technology
DODIC	Department of Defense Identification Code
DOT&E	Director of Operational Test and Evaluation
DPALS	Diode Pumped Alkali Laser System
DPF	MDA Facilities, MILCON & Environmental Management Directorate
DREN	Defense Research Engineering Network
DRSN	Defense Red Switch Network
DSA	Digital Simulation Architecture
DSCS	Defense Satellite Communication System
DSWS	David's Sling Weapon System
DT&E	Developmental Test and Evaluation
DTIC	Digital Test and Integration Center
DTLOMS	Doctrine, Training, Leadership, Organization, Materiel, Soldier
DTRA	Defense Threat Reduction Agency
DW	Defense Wide
DWCF	Defense Working Capital Fund
E	
E/CCA	Element/Component Characteristics for Analysis
EA	Executing Agent; Engineering Assessment
EADSIM	Extended Air Defense Simulation
EAL	Evaluated Assurance Level
EAS	Eareckson Air Station
ECS	Element Capability Specification; Engineering Change Summary
EDP	Evolutionary Development Program
EECS	Event Execution Control System
EEU	Electronics Equipment Unit
EGP	Exceedance Generation Processing
EHF	Extremely High Frequency
EKV	Exoatmospheric Kill Vehicle
E-LRALT	Enhanced Long Range Air Launch Target
EMRLS	Engineering and Manufacturing Readiness Levels
eMass	Enterprise Mission Assurance Support Service
EMD	Engineering, Manufacturing, and Development
EMDR	Executive Mission Data Review
EME	Empirical Measurement Events
eMRBM	Extended Medium Range Ballistic Missile
EMRL	Engineering and Manufacturing Readiness Level
EO/IR	Electro-Optical/Infrared
EOC	Engagement Operations Center
EOIR	Engage-on-Remote
EPAA	European Phased Adaptive Approach
EQLB	Executive Quick Look Briefing
ESD	Enterprise System Directorate
ESI	External System Interface; Enterprise Software Initiative
ESL	External Sensors Lab
ESOH	Environmental, Safety and Occupational Health
ET	Embedded Test;
ETTEDS	End to End Distributed Development System
EUCOM	European Command
EVMS	Earned Value Management System
EWR	Early Warning Radar

ACRONYMS AND ABBREVIATIONS

EWS	Enterprise Work Stations
F	
FCS	Fire Control Section; Fire Control System (SPY/FCS - AN/SPY radar Fire Control System)
FDE	Force Developers Evaluation
FFP	Firm Fixed Price
FFPLOE	Firm Fixed Prices Level of Effort
FFRDC	Federally Funded Research and Development Center
FISMA	Federal Information Security Management Act
FLITES	Fast Line-of Sight Imagery for Target and Exhaust Plume Signatures
FMA	Foreign Material Acquisition; Foreign Military Asset
FMS	Foreign Military Sales
FOCI	Foreign Ownership, Control, and Influence
FOIA	Freedom of Information Act
FPA	Focal Plane Array
FPAF	Fixed Price Award Fee
FPIF	Fixed Price Incentive Fee
FT	Flight Test
FTF	Flexibility Target Family
FTG	Flight Test GMD
FTM	Flight Test Mission
FTO-02	Flight Test Operational-02
FTT	Flight Test - THAAD
FY	Fiscal Year
FYDP	Future Years Defense Program
G	
GaAs	Gallium arsenide
GaN	Gallium Nitride
GBI	Ground Based Interceptor
GBR-P	Ground Based Radar Prototype
GCC	Geographic Combatant Commander
GCCS-M	Global Command and Control System - Maritime
GCN	Global Command Network; GMD Communications Network
GD	Global Deployment
GDDT	Government Directed Down Time
GEM	Global Engagement Manager; Guidance Enhancement Missiles (PATRIOT)
GENSER	General Services
GEOINT	Geospatial Intelligence
GEP	Ground Entry Point
GFC	GMD Fire Control
GFC / C	GMD Fire Control and Communications
GFE	Government Furnished Equipment
GFS	Government Furnished Services
GIG	Global Information Grid
GM	Ground-based Midcourse
GMD	Ground-based Midcourse Defense
GPS	Global Positioning System
GS	Ground Systems
GSOC	Global Security Operations Center
GT	Ground Test
GTD	Ground Test Distributed
GTI	Ground Test Integrated
GTRI	Georgia Tech Research Institute
GTX	Ground Test (Element to Element)
GWS	GEM Work Stations

ACRONYMS AND ABBREVIATIONS

H	
HAENS	High Altitude Exoatmospheric Nuclear Survivability
HEMP	High Altitude Electromagnetic Pulse
HEMTT	Heavy Expanded Mobility Tactical Truck
HIL	Human-in-the-Loop; Hardware-in-the-Loop
HMOC	Huntsville Mission Operations Center
HOSC	Huntsville Operations Support Center
HRTS	Human Resource Tracking System
HWIL	Hardware-in-the-loop
I	
I&T	Integration & Test
IA	Information Assurance
IAI	Israel Aircraft Industries
IAM	Information Assurance Manager
IAMD	Integrated Air and Missile Defense
FPAF	Fixed Price Award Fee
IAS	Interocean American Shipping
IAW	In Accordance With
IBCS	Integrated Battle Command System
IBR	Integrated Baseline Review
IBS	Integrated Broadcast Service
ICBM	Intercontinental Ballistic Missiles
ICD	Interface Control Document
ICE	Independent Cost Estimate
ICOFT	Institutional Conduct of Fire Trainer
ICP	Interface Change Proposal
IDIQ	Indefinite Delivery Indefinite Quantity
IDMP	Integrated Data Management Plan
IDT	In-Flight Interceptor Communications System Data Terminal
IEM	Integrated Electronics Module
IETM	Integrated Electronic Technical Manual
IETT	Integrated Event Test Team
IFICS	In-Flight Interceptor Communications System
ILP	Initial Lot Production
ILS	Integrated Logistics Support
IM	Insensitive Munitions
IMAP	Integrated Master Assessment Plan
IMD	Integrated Missile Defense
IMoD	Israeli Ministry of Defense
IMTP	Integrated Master Test Plan
IMU	Inertial Measurement Unit
IMVP	Integrated Master VV&A Plan
INFOSEC	Information Security
IPA	Intergovernmental Personnel Act
IR	Infra-red
IRBM	Intermediate-Range Ballistic Missiles
IRES	Integrated Research and Development for Enterprise Solutions
ISA&I	Israeli System Architecture and Integration
ISET	Integrated Systems Engineering Team
ISIM	International Simulation
ISSM	Information System Security Manager
IT	Integrated Test; Information Technology
ITB	Institutional Training Base; Israeli Test Bed
IV&V	Independent Verification and Validation
IWS	Indications and Warning System; Integrated Warfare Systems
J	

ACRONYMS AND ABBREVIATIONS

JAMEX	Jamming Exercise
JAT	Joint Analysis Teams
JBTEC	Joint BMDS Training and Education Center
JEWL	Joint Early Warning Laboratory
JFCC	Joint Functional Component Command
JFCC-IMD	Joint Functional Component Command - Integrated Missile Defense
JHU	John Hopkins University
JHU/APL	John's Hopkins University/Applied Physics Laboratory
JMOD	Japan Ministry of Defense
JNIC	Joint National Integration Center, Schriever AFB, CO
JPOW	Joint Project Optical Windmill
JRDC	JNIC) Research and Development Contract
JRMET	Joint Reliability and Maintainability Engineering Team
JTF-GNO	Joint Task Force-Global Network Operations
JTIDS	Joint Tactical Information Data System
JTOC	JNIC Target Operations Center
JWSP	Joint Warfighter Support Program
K	
KHILS	Kinetic Kill Vehicle hardware in-the-Loop Simulator
KIDD	Kinetic Impact Debris Distribution
KV	Kill Vehicle
KW	Kinetic Warhead
L	
L&TSE	Launch and Test Support Equipment
LBSM3	Land Based SM-3 (early name for Aegis Ashore)
LCC	Launcher Control Center
LFSV	Latest Fielded Software Version
LHCT	Long Haul Communications Transport
LLNL	Lawrence Livermore National Laboratory
LM	Lockheed Martin
LMSSC	Lockheed Martin Space Systems Company
LNO	Liaison Officer
LoR	Launch on Remote
LPLD	Low Power Laser Demonstrator
LRDS	Long Range Detection Suite
LRS&T	Long Range Surveillance and Tracking; Long Range Surveillance and Track
LRU	Line Replaceable Unit'
LSC	Launch Support Systems;
LSE	Launch Support Equipment
LSS	Launch Support Systems; Launch Site Controller
LTPO	Lower Tier Program Office
M	
M&S	Materials and Structure; Modeling and simulation
M&S	Models and Simulation
MAIS	Major Automated Information System
MAP	MDA Assurance Plan; MDA Assurance Provisions
MAR	MDA Assurance Representative
MARS	Modular Analysis and Reporting Suite
MARAD	Maritime Administration
MASINT	Measures and Signals Intelligence
MAX/MIF	Maximum (number of)/Missiles In Flight
MD	Missile Defense
MDA	Missile Defense Agency
MDAHQ	Missile Defense Agency Headquarters
MDAP	Major Defense Acquisition Program
MDEB	Missile Defense Executive Board

ACRONYMS AND ABBREVIATIONS

MDIOC	Missile Defense Integrated Operations Center
MDR	Mission Data Review
MDSDC	Missile Defense Space Development Center
MDSE	Missile Defense System Exerciser
MDSEC	Missile Defense Space Experimentation Center
MDST	Missile Defense Space Warning Tool
MET	Modernization Enterprise Terminal
MFRL	Modification and Fielding Request List
MFU	Missile Firing Unit
MHA	Management Headquarters Activity
MICS	MDA Integrated Communications Services
MiDAESS	Missile Defense Agency Engineering and Support Services
MIF	MIF
MILCON	Military Construction; Military Construction funding (type of Appropriation)
MIL-STD	Military Standards
MIP	Master Integration Plan
MIPR	Military Interdepartmental Purchase Request
MIS	MDSDC Interchange System; MDSEC Interchange System
MIT	Miniature Interceptor Technology; Massachusetts Institute of Technology
MIT/LL	Massachusetts Institute of Technology, Lincoln Laboratory, Lexington, MA
MMR	Multi-Mission Radar
MOC	Missile Defense Agency Operations Center
MoKVA	Modular open Kill Vehicle Architecture
MOU	Memorandum of Understanding
MPAT	Producibility and Manufacturing Technology
MPL	ManPower Loading
MRA	Mission Readiness Assessment
MRBM	Medium-Range Ballistic Missiles
MRT	Medium Range Target
MRTF	Major Range and Test Facilities
MSR	Minimum Sustaining Rate
MTOE	Modified Table of Organization and Equipment
MTS	Multi-Spectral Targeting System
MTS-C	Multi-Spectral Targeting System-Cs
N	
NASIC	National Air and Space Intelligence Center
NATO	North Atlantic Treaty Organization
NAVFAC	Naval Facilities Engineering Command; Naval Facility
NAVSEA	Naval Sea Systems Command
NAWC	Naval Air Warfare Center
NCR	National Capital Region
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NFIRE	Near Field Infrared Experiment
NGAS	Northrop Grumman Aerospace Systems
NGST	Northrop Grumman Space Technology
NIPRNET	Non-Secure Internet Protocol Router Network
NIST	National Institute of Standards and Technology
NORAD	North American Aerospace Defense Command
NORTHCOM	Northern Command
NRE	non-recurring engineering
NRL	Naval Research Laboratory, Washington, DC
NRT	Navy Review Team
NSA	National Security Agency
NSWC	Naval Surface Warfare Center
NTD	Near-Term Discrimination

ACRONYMS AND ABBREVIATIONS

O	
O&M	Operations and Maintenance
O&S	Operations and Sustainment
OA	Open Architecture
OCO	Overseas Contingency Operations
OCONUS	Outside of CONUS
OGA	Other Government Agency
OMB	Office of Management and Budget
ONIR	Overhead Non-Imaging Infra-Red
OPIR	Overhead Persistent Infrared
OPLAN	Operations Plan
OPSCAP	Operations Capabilities
OPTISIG	Optical Signatures In-Line Generator
ORNL	Oak Ridge National Laboratory
OSA	Open Systems Architecture
OSC	Operations Support Center
OSD	Office of the Secretary of Defense
OSF	Objective Simulation Framework
OSFC	Operations Forces Standing Committee
OSM	Object Sighting Message; Open Systems Architecture Sensor Models
OSPT	Operations Support Planning Team
OSS	Off-Shore Support; Optimistic Sensor Model
OTA	Operational Test Agencies
P	
P&P	Policy and Procurement
PA	Performance Assessments; Project Arrangement
PAA	Phased Adaptive Approach
PAAWNS	Protected Anti-Jam (AJ) / Anti-Scintillation (AS) Wideband Network System
PAC-3	Patriot Advanced Capability-3
PACOM	U.S. Pacific Command
PAM	Planning Allocation Matrix
PB	President's Budget
PBL	Performance Based Logistics
PCO	Procurement Contracting Office
PDR	Preliminary Design Review
PDSS	Post Deployment Software Support
PE	Program Element
PEELS	Parametric Endo/Exo-atmospheric Lethality Simulation
PEGEM	Post Engagement Ground Effects Model
PEO IWS	Program Executive Office - Integrated Warfare Systems
PFR	Post Flight Reconstruction
PHACIL	Phacil, Incorporated
PIA	Post Intercept Assessment
PIDS	Prime Item Development Specifications
PLET	Phenomenology, Lethality, Environment, Threat
PLT	Production Lead Time
PLUS	Plume Simulation
PM	Program Manager
PM/IAM	Program Manager/Information Assurance Manager
PMAP	Process Mission Assurance Plan
PMDCATS	Program Manager - Communications and Transmission Systems
PME	Primary Mission Equipment
PMI	preventative maintenance inspection
PMP	Parts, Materials and Processes
PMRF	Pacific Missile Range Facility, Barking Sands, Kauai, HI
PMT	Pre-Mission Test

ACRONYMS AND ABBREVIATIONS

POA&M	Plan of Action and Milestones
POC	Point of Contact
PPR	Pre-Planned Responses
PPU	Prime Power Unit
PROCAP	Protection Capability
PSEM	Patriot System Effectiveness Model
PSN	Parallel Staging Area
PTSS	Precision Tracking Space System
PWS	Program-Wide Support
PY	Prior Year
Q	
QLB	Quick Look Briefing
QoS	Quality of Service
QRT	Quick Response Team
Q SMA	Quality Safety and Mission Assurance
R	
RAFU	Radar Field Upgrade
RAM	Reliability, Availability and Maintainability
RASP	RApid Scenario Prototype
RCS	Radar Cross Section
RDEC	Research, Development, and Engineering Center
RDECOM	Research, Development, Engineering Command
RDT&E	Research, Development, Test & Evaluation
RF	Radio Frequency
RFA	Requests for Analysis
RFARFI	Request for Analysis Request for Information
RFI	Requests for Information
RFP	Request for Proposal
RMF	Risk Management Framework
RMF	Risk Management Framework
RMOET	Radar March Order & Emplacement Trainer
ROI	Return on Investment
ROIC	Read Out Integrated Circuit
RPFM	Rocket Plume Flowfield Model
RSC	Radar Sustainment Contract
RSO	Resident Space Object
RTI	Return to Intercept
RTS	Ronald Reagan Test Site, Kwajalein, Marshall Islands
RV	Reentry Vehicle
S	
SATCOM	Satellite Communications
SBIR	Small Business Innovative Research
SBIR/STTR	Small Business Innovative Research/Small Business Technology Transfer
SBIRS	Space Based Infrared System
SBT	Sea Based Terminal
SBX	Sea Based Test X-Band Radar
SCA	Security Control Assessments
SCARE	Software Change Analysis Review Environment
SCD	SM-3 Cooperative Development; Standard Missile-3 Cooperative Development (Program)
SCG	Security Classification Guides
SCN	System Change Notices
SCORE	System Coordination and Observation Reporting Environment
SCR	SM-3 Cooperative Development; System Capability Review
SCRM	Supply Chain Risk Management
SDACS	Solid Divert Attitude Control System

ACRONYMS AND ABBREVIATIONS

SDD	System Description Document
SDL	Space Dynamics Laboratory
SDR	System Design Review; Software Design Review
SE&I	Systems Engineering and Integration
SEI	Systems Engineering & Integration
SEAR	System Engineering Assessment Report
SED	Software Engineering Design
SEPM	System Engineering Program Management
SGP	Super Green Pine
SIAO	Senior Information Assurance Officer
SIAO/CA	Senior Information Assurance Officer (SIAO)/Certification Authority (CA)
SIGNIT	Signal Intelligence
SIM	Simulation
SIPRNET	Secret Internet Protocol Router Network
SIU	SSF Interface Unit
SIV	silo interface vault
SKA	Space-based Kill Assessment
SM	Standard Missile
SM-3	Standard Missile -3
SMDC	Space and Missile Defense Command, U.S. Army
SMDC/ARSTRST	Space and Missile Defense Command/Army Forces Strategic Command
SME	Subject Matter Expert
SMM	System Mission Manager
SNL	Sandia National Lab
SNWC	Space and Naval Warfare Command
SOLD	Simulation-Over-Live Driver
SPAWAR	Naval Space and Warfare Command; Space and Naval Warfare Systems Command
SPFR	System Post Flight Reconstruction
SPMT	System Pre Mission Test
SPS	Standard Procurement System
SPURC	Standard Plume Ultraviolet Radiation Code
SRALT	Short Range Air Launch Target
SRBM	Short-Range Ballistic Missiles
SRBMD	Short Range Ballistic Missile Defense
SRHSM	Sensor Registration Health & Status Monitoring
SRP	Stockpile Reliability Program
SRR	System Requirements Review; Software Readiness Review
SS	Sole Source; Summary Screens; System Specification
SS/CPAF	Sole Source/ Cost Plus Award Fee
SS/CPFF	Sole Source/ Cost Plus Fixed Fee
SSA	Space Situational Awareness
SSC	System Security Concept
SSF	Single Stimulation Framework
STEM	Science, Technology, Engineering, and Mathematics
STFM-01	Standard Missile-3 Flight Test Standard Missile-01
STOC	System Test and Operations Center
STRATCOM	US Strategic Command
STSS	Satellite Tracking and Surveillance System; Space Tracking and Surveillance System
STTR	Small Business Technology Transfer
SYMP	Symposium
T	
T&E	Test and Evaluation
TALSS	THAAD Active Leak Sensor System
TC	Targets and Countermeasures
TCD	Technical Capability Declaration
TCM	Total downtime due to corrective maintenance actions including logistics
TDA	Table of Distribution and Allowances

ACRONYMS AND ABBREVIATIONS

TDA	Technical Decision Authority
TDACS	Throttleable Divert and Attitude Control System
TDS	Terminal Defense Segment
TEC	Test Execution Control
TECC	Theater Enterprise Computing Center
TECHREP	Technical Representative
TFCC	THAAD Fire Control and Communications
TGx	Trajectory Generator - External
THAAD	Terminal High Altitude Area Defense
TIL	Test Integration Lab
TIM	Technical Interchange Meeting
TMC	Threat Modeling Center
TMI	Technology Maturation Initiatives
TMSS	Threat Modeling Simulation System
TOO	Test of Opportunity; Target of Opportunity
TOR	Trouble Observation Reports
TPM	Technical Performance Measurement; Total downtime due to preventative maintenance actions including logistics delay
TRIMM	Transmit/Receive Integrated Microwave Module
TRM	Test Resource Manager
TRMP-T	Test Resources Mission Planning Tool
TSG	Tactical Support Groups
TSS	Training Support System
TT	Total Time
TTP	Tactics, Techniques & Procedures
TU	Threat Upgrade
U	
UARC	University Affiliated Research Center
UAV	Unmanned Aerial Vehicle
UEWR	Upgraded Early Warning Radar
ULCHI	Ulchi Freedom Guardian
UNET	Unclassified Network
USAFE	U.S. Air Forces in Europe
USDAT&L	Office of Under Secretary of Defense/Acquisitions, Technology and Logistics OUSD/AT&L
USN	United States Navy
USNORTHCOM	United States Northern Command
USPACOM	United States Pacific Command
USSTRATCOM	United States Strategic Command
UUR	University-to-University
V	
V&A	Verification & Assessment
V&V	verification and validation
VACSSim	Virtual Aegis Combat System Simulation
VAFB	Vandenberg Air Force Base, CA
VGI	VLS GPS Interface
VLS	Vertical Launching System; Vertical Launch System
VOIP	Voice Over Internet Protocol
VTC	Video Teleconferencing
VV&A	Verification, Validation, and Accreditation
VVACB	Verification, Validation and Accreditation Control Board
VVAWG	VV&A working group
W	
WETLANS	Wargames, Exercises and Training Local Area Networks
WIP	Warfighter Involvement Process
WSC	Wargames Support Center

ACRONYMS AND ABBREVIATIONS

WSMR	White Sands Missile Range, White Sands, NM
WSTF	White Sands Test Facility
X	
XAOR	Cross-Area of Responsibility
XBR	X-Band Radar
Y	
YPG	Yuma Proving Ground

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603176C / <i>Advanced Concepts and Performance Assessment</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	16.918	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
MD71: <i>Advanced Concepts and Performance Assessments</i>	16.458	11.283	17.298	11.612	-	11.612	11.765	11.924	12.096	12.368	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	0.460	0.570	0.582	0.829	-	0.829	0.676	0.720	0.762	0.805	Continuing	Continuing
MC71: <i>Cyber Operations</i>	-	0.000	0.000	0.555	-	0.555	1.300	2.404	2.461	3.188	0	9.908

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The Advanced Concepts & Performance Assessments PE delivers an integrated government concept definition, simulation, and analysis capability and centralizes assessment of advanced ballistic missile defense technology. Delivering insight into the performance of proposed concepts extends MDA's ability to address evolving threats for the warfighter.

Subject matter experts provide independent assessments of government, university, and industry technology concepts, used in concert with systems engineering requirements to support acquisition strategy decisions and define technology focus areas. The innovative structured concept definition and assessment methodology enables the MDA to quickly validate focus areas, verify contractor technology solutions, and evaluate promising concepts in future Ballistic Missile Defense System (BMDS) architectures. This methodology significantly enhances MDA's ability to assess technology concepts while decreasing the cost of development through:

- Independent model-based simulations of industry technology concepts to inform the systems engineering process
- Digital simulation and hardware-in-the-loop performance assessments of algorithms and hardware concepts prior to expensive live fire test events
- End-to-end testing of technology concepts integrated with weapon systems and Command, Control, Battle Management and Communications

Performance assessment of advanced concepts incorporates Better Buying Power philosophy in the earliest stages of technology development to maximize technology investments with minimal investment. Performance assessment supports evaluation and analysis of capabilities for both right and left of launch.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603176C / <i>Advanced Concepts and Performance Assessment</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	12.139	17.880	12.599	-	12.599
Current President's Budget	11.853	17.880	12.996	-	12.996
Total Adjustments	-0.286	0.000	0.397	-	0.397
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.022	0.000			
• SBIR/STTR Transfer	-0.264	0.000			
• Other Adjustment	0.000	0.000	0.397	-	0.397

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603176C / <i>Advanced Concepts and Performance Assessment</i>				Project (Number/Name) MD71 / <i>Advanced Concepts and Performance Assessments</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD71: <i>Advanced Concepts and Performance Assessments</i>	16.458	11.283	17.298	11.612	-	11.612	11.765	11.924	12.096	12.368	Continuing	Continuing

Note

N/A

A. Mission Description and Budget Item Justification

Advanced Concepts & Performance Assessment centralizes advanced technology concept modeling, simulation, software, and analysis. Integrating models of promising technical solutions into BMDS system-level simulations enables leadership to make data driven acquisition and technology investment decisions. This funding capitalizes on the innovation of small business, universities, Federally Funded Research and Development Centers, and University Affiliated Research Centers to pursue a broad range of hardware, software, models, algorithms, trade studies and analysis. These innovations bring together government developed models representing existing and future ballistic missile defense architectures, technology concepts, and advanced algorithms to provide detailed assessments of concept performance and inform investment decisions. These innovations, combined with a robust high performance computing infrastructure, provide a unique in-house government capability to demonstrate and assess technology concepts.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Advanced Concepts and Performance Assessment	FY 2016	FY 2017	FY 2018
Description: Advanced Concepts and Performance Assessment's diverse staff of subject matter experts developed advanced concepts across the broad spectrum of ballistic missile defense technology initiatives. Recurring Accomplishments: -Prioritize technology investments and inform requirements -Work with the BMDS Architect and MDA Systems Engineer to design concepts, build models and assess technology concepts for the future BMDS -Analyze and evaluate industry sensor and kill vehicle concepts -Develop and extend modeling techniques -Demonstrate concept performance against evolving threats -Focus research and engineering activities from university and small business partners to identify suitable technology and concepts that improve BMDS performance through a rapid innovation model based on engineering test bed	11.283	17.298	11.612
FY 2016 Accomplishments: -Funded upgrades to the digital simulation and hardware-in-the-loop infrastructure required to move from Multi-Spectral Targeting System (MTS)-B to MTS-C hardware and airborne processor software prior to the Controlled Test Vehicle flight test and the			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / <i>Advanced Concepts and Performance Assessment</i>	Project (Number/Name) MD71 / <i>Advanced Concepts and Performance Assessments</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Pacific Dragon flight test. Efforts lead up to the currently planned Aegis Launch-on-Remote tracking exercise and live fire test missions in FY 2017 and FY 2018</p> <ul style="list-style-type: none"> -Analyzed discrimination sensor flight tests -Conducted HWIL tests -Developed modular open kill vehicle architecture testbed -Matured tracking, discrimination, and sensor fusion algorithms -Demonstrated precision track through digital and HWIL simulation exercises -Reduced time to translate innovative technology into BMDS capability by providing integrated models of emerging concepts that characterize key parameters and expected performance <p>FY 2017 Plans: Increase from FY 2016 to FY 2017 funds post-test and planned data replay simulation events, hardware in the loop infrastructure, high performance computing infrastructure upgrade, as well as test costs required for performance assessments for Aegis Launch-on-Remote live fire test and advanced sensor demonstration.</p> <ul style="list-style-type: none"> -Define and analyze sensor discrimination capability using flight test data -Mature tracking, discrimination, and sensor fusion algorithms for multi-phenomenology sensor platform -Demonstrate end-to-end correlation of sensor track and discrimination data through digital and hardware-in-the-loop simulation exercises -Conduct performance analysis of government and industry Multi-Object Kill Vehicle and low-power and multi-kilowatt directed energy concepts -Incrementally demonstrate contribution to BMD for launch-on-remote, engage-on-remote, discrimination, and handover improvements for next-generation sensors and kill vehicle concepts -Demonstrate ruggedized deployable virtual testbed to provide onsite assessment of flight test data in near real-time -Implement modular open kill vehicle architecture testbed to verify industry concepts -Accelerate development of hardware in the loop infrastructure required for assessment and testing of advanced sensor and directed energy concepts in preparation for concept demonstrations -Update High Performance Computing infrastructure to improve security and performance of concept assessment models and simulations <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> -Conduct performance analysis of government and industry concepts for multi object kill vehicle and directed energy to: -Assess the reduction of the number of interceptors required to destroy each credible, lethal object in the raid -Evaluate sensor concepts' ability to reduce the number of credible objects assessment of directed energy concepts and identification of promising discrimination techniques 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / <i>Advanced Concepts and Performance Assessment</i>	Project (Number/Name) MD71 / <i>Advanced Concepts and Performance Assessments</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
-Incrementally demonstrate contribution to BMD for launch-on-remote, engage-on-remote, discrimination, and handover improvements for next-generation sensors and kill vehicle concepts -Execute realistic test scenarios to complete performance evaluations quantifying emerging sensor capability -Incorporate real-time sensor processing in hardware-in-the-loop events to serve as the proving ground for mission architecture -Combine actual flight test data with simulated data to mature tracking, discrimination, and sensor fusion algorithms for multi-phenomenology sensor platform -Expand the modular open kill vehicle architecture testbed to verify industry concepts -Update high performance computing infrastructure to improve cybersecurity posture and performance of concept assessment models and simulations -Assess technology and concepts to predict performance against advanced threats			
Accomplishments/Planned Programs Subtotals	11.283	17.298	11.612

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0603294C: <i>Common Kill Vehicle Technology</i>	60.851	0.000	252.879	-	252.879	321.175	110.934	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Continues a successful partnership with small business, the Aviation & Missile Research Development & Engineering Center, Federally Funded Research and Development Centers, and University Affiliated Research Centers to provide concept modeling and assessment capability. This innovative strategy leverages agency and partner subject matter experts and government model-based assessments to inform Better Buying Power acquisition decisions.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603176C / <i>Advanced Concepts and Performance Assessment</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	0.460	0.570	0.582	0.829	-	0.829	0.676	0.720	0.762	0.805	Continuing	Continuing

A. Mission Description and Budget Item Justification

Program Wide Support (PWS) contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / <i>Advanced Concepts and Performance Assessment</i>	Project (Number/Name) MC71 / <i>Cyber Operations</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC71: <i>Cyber Operations</i>	-	0.000	0.000	0.555	-	0.555	1.300	2.404	2.461	3.188	0	9.908

Note

N/A

A. Mission Description and Budget Item Justification

This project supports the monitoring and tracking of Cybersecurity mitigations as required in the Department of Defense Instruction Number 8510.01 which establishes risk Management Framework (RMF) requirements for DoD Information Technology (IT). Funds in this project implement and sustain DoD-required RMF and associated Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance System Security Manager (PM/ISSAM) Plans of Action and Milestones (POAMs) for enabling M&S mission systems. This project captures the RMF documentation (artifacts, validation results, Information Assurance Risk Assessment results, and MDA Authorizing Official (AO) and Chief Information Officer (CIO) accreditation decisions) into the Defense Information Systems Agency's (DISA) Enterprise Mission Assurance Support Service (eMASS) system. Hardware and software upgrades required to meet DoD standards are supported by funding in this project. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
Title: Information Assurance / Cyber Network Defense	0.000	0.000	0.555
<p>Description: Funds network defense and Information System Security Manager (ISSM) activities including:</p> <ul style="list-style-type: none"> -Conduct Cybersecurity/information assurance engineering and architecture planning. -Plan and test information assurance controls. -Develop DoD Risk Management Framework (RMF) certification and accreditation packages. -Conduct Controls Validation Testing of systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies. -Conduct annual information assurance reviews to assess compliance in implementing and maintaining information assurance controls. 			
FY 2016 Accomplishments:			
N/A			
FY 2017 Plans:			
N/A			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / <i>Advanced Concepts and Performance Assessment</i>	Project (Number/Name) MC71 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
N/A			
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.555

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	64.614	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
MD95: <i>Discrimination Sensor Technology</i>	62.781	23.141	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
MT95: <i>Discrimination Sensor Tech-Flight Test Execution</i>	-	3.693	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	3.693
MD40: <i>Program-Wide Support</i>	1.833	1.147	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

As of FY 2017 no funding is requested in this Program Element. The technology developed in the Discrimination Sensors Technology Program Element is technically mature enough to develop prototype systems. The follow on activity for the Program Element is captured in Technology Maturation Initiatives, Program Element 0604115C.

A. Mission Description and Budget Item Justification

As of FY 2017 no funding is requested in this Program Element. The technology developed in the Discrimination Sensors Technology Program Element is technically mature enough to develop prototype systems. The follow on activity for the Program Element is captured in Technology Maturation Initiatives, Program Element 0604115C.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	28.200	0.000	0.000	-	0.000
Current President's Budget	27.981	0.000	0.000	-	0.000
Total Adjustments	-0.219	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.312	0.000			
• SBIR/STTR Transfer	-0.531	0.000			
• Other Adjustment	0.000	0.000	0.000	-	0.000

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>
---	---

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MD95 / <i>Discrimination Sensor Technology</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD95: <i>Discrimination Sensor Technology</i>	62.781	23.141	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

FY 2018 funding is requested in the Technology Maturation Initiatives Program Element, 0604115C, for follow on MTS-C advanced sensor development and prototype development and test.

A. Mission Description and Budget Item Justification

As of FY 2017 no funding is requested in this Program Element. The technology developed in the Discrimination Sensors Technology Program Element is technically mature enough to develop prototype systems. The follow on activity for the Program Element is captured in Technology Maturation Initiatives, Program Element 0604115C.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
Title: Discrimination Sensor Technology	23.141	0.000	0.000
Description: As of FY 2017 no funding is requested in this Program Element. The technology developed in the Discrimination Sensors Technology Program Element is technically mature enough to develop prototype systems. The follow on activity for the Program Element is captured in Technology Maturation Initiatives, Program Element 0604115C.			
FY 2016 Accomplishments: - Completed MTS-C sensor tests to demonstrate Aegis Launch on Remote quality of track performance: -- Conducted Continental United States (CONUS) checkout flights to collect data for Hardware-in-the-Loop simulations, sensor characterization and confirm system readiness in preparation for the 2Q FY 2016 Control Test Vehicle (CTV)-02+ BMDS test -- Conducted MTS-C Control Test Vehicle (CTV)-02+ pre and post-test performance analysis -- Analyzed BMDS test data to verify demonstration of quality of service to meet Aegis Launch on Remote requirements -- Analyzed airborne sensor BMDS test data to demonstrate MTS-C discrimination performance - Partnered with the Air Force to characterize MTS-C performance for air dominance			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	23.141	0.000	0.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MD95 / <i>Discrimination Sensor Technology</i>
--	---	--

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0603294C: <i>Common Kill Vehicle Technology</i>	60.851	0.000	252.879	-	252.879	321.175	110.934	0.000	0.000	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0604115C: <i>Technology Maturation Initiatives</i>	24.743	99.366	128.406	-	128.406	168.388	174.432	176.660	177.264	Continuing	Continuing

Remarks

D. Acquisition Strategy

The acquisition strategy for Discrimination Sensor Technology consisted of contracts to industry via the Advanced Technology Innovation Broad Agency Announcement and agreements with Federally Funded Research and Development Centers and University Affiliated Research Centers. The MDA leveraged Agency and partner subject matter experts and used government model based assessments to inform Better Buying Power philosophy acquisition decisions. The MDA awarded contracts to industry and universities via the Advanced Technology Innovation Broad Agency Announcement to develop and demonstrate promising components and integrated systems in realistic test environments. Discrimination Sensor Technology shaped future BMDS acquisition decisions by advancing and documenting the technology readiness levels of emerging and developing technology, while simultaneously assessing the performance and contributions of the technology to the BMDS architecture.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>				Project (Number/Name) MT95 / <i>Discrimination Sensor Tech-Flight Test Execution</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
<i>MT95: Discrimination Sensor Tech-Flight Test Execution</i>	-	3.693	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	3.693

Note

The Discrimination Sensor Technology Flight Test Execution project will complete technology demonstration of real time stereo tracking with MTS-Cs. FY 2018 funding is requested in the Technology Maturation Initiatives Program Element, 0604115C, for follow on MTS-C advanced sensor prototype development and test.

A. Mission Description and Budget Item Justification

The Discrimination Sensor Technology Flight Test project funded management and execution of Discrimination Sensor Technology testing through technology demonstration of Aegis Launch-on-Remote real time stereo tracking with Multi-Spectral Targeting System - Cs. The Discrimination Sensor Technology flight test project leveraged other BMDS tests as an associated operation to gather sensor data.

In FY 2015, the MDA successfully tested two MTS-B sensors integrated into MQ-9 Reapers. The Discrimination Sensor Technology tests used the BMDS operational architecture, proving that the Aegis weapon system could launch a Standard Missile - 3 against a ballistic missile target and achieve intercept using the tracking data from the airborne MTS sensors.

In FY 2016, the Discrimination Sensor Technology Flight Test project tested two MTS-Cs integrated into MQ-9 Reapers to demonstrate increased track precision and discrimination capability for the BMDS. As a precursor to the BMDS testing, the MDA is partnering with the Air Force to characterize MTS performance and provide data for Air Force air dominance development planning.

The Discrimination Sensor Technology Flight Test project funded flight, operations and maintenance costs for Unmanned Aerial Vehicles, ground control stations and ground support equipment. It also funded shipping of the test assets to test ranges, labor, travel, range support and Command, Control, Battle Management and Communications test support specific to Discrimination Sensor Technology.

The results from this airborne MTS-C Launch on Remote test sequence mature the critical technologies necessary for prototype development under the Technology Maturation Initiatives Program Element 0604115C. Launch on Remote is the precursor to Engage on Remote, which significantly expands BMD reach and the defended area.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Discrimination Sensor Technology Flight Test Execution	FY 2016	FY 2017	FY 2018
Description: N/A	3.693	0.000	0.000
FY 2016 Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MT95 / <i>Discrimination Sensor Tech-Flight Test Execution</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
- Conducted system level Hardware-in-the-Loop (HWIL) testing in conjunction with the Enterprise Sensor Laboratory (ESL) and the Experimental Laboratory (X-Lab) for the Pacific Dragon test - Shipped two MQ-9 Reapers, MTS-Cs and ground support equipment - Conducted Pacific Dragon checkout flights, dry-runs, and dress rehearsals and operate and maintain the Unmanned Aerial Vehicles (UAVs), test equipment, ground control stations and ground support equipment - Conducted real time stereo track test to provide Aegis Launch on Remote quality of track using MTS-Cs installed on two MQ-9 Reaper UAVs in conjunction with the Pacific Dragon test and identified system tracking improvements FY 2017 Plans: N/A FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	3.693	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0603294C: <i>Common Kill Vehicle Technology</i>	60.851	0.000	252.879	-	252.879	321.175	110.934	0.000	0.000	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>	Project (Number/Name) MT95 / <i>Discrimination Sensor Tech-Flight Test Execution</i>
--	---	--

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

Remarks

D. Acquisition Strategy

The MDA Integrated Master Test Plan establishes and documents the test requirements for the BMDS with the specific focus on collecting the data needed for the Verification, Validation, and Accreditation of the BMDS models & simulations. This paradigm uses critical factor analysis to drive test design, planning, and execution for accrediting models & simulations, which is used to validate and assess system performance. With this test approach, the MDA will establish confidence that the models & simulations used to evaluate the BMDS represent real world behavior, thereby enabling simulation-based performance assessment to verify system functionality.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603177C / <i>Discrimination Sensor Technology</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	1.833	1.147	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

As of FY 2017 no funding is requested in this Program Element. The technology developed in the Discrimination Sensors Technology Program Element is technically mature enough to develop prototype systems. The follow on activity for the Program Element is captured in Technology Maturation Initiatives, Program Element 0604115C.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603178C / <i>Weapons Technology</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	106.664	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
MD69: <i>Directed Energy Research</i>	47.006	25.314	47.691	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
MD72: <i>Interceptor Technology</i>	58.953	22.818	22.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	0.705	2.131	2.152	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Divert and Attitude Control System (DACS) was transferred to PE 0603294C Common Kill Vehicle Technology beginning in FY 2018.

A. Mission Description and Budget Item Justification

The Weapons Technology Program Element develops and tests a high-powered directed energy laser to build the foundation of the next-generation laser system on a high altitude unmanned airborne platform. The MDA's High Energy Laser (HEL) investment incrementally develops scalable, efficient, and compact HEL technology in the laboratory before beginning a high power laser flight test program. The technology required for tracking the target, aiming the laser, and building flight demonstrators is developed under the Technology Maturation Initiatives (TMI) Program Element (0604115C).

MDA collaborates with the Office of the Assistant Secretary of Defense for Research and Engineering, the Defense Advanced Research Projects Agency (DARPA), the High Energy Laser Joint Technology Office (HELJTO), and the Air Force in a systems engineering based strategy to research, develop and test directed energy weapons technology. MDA is developing a set of common core technology that will enable both missile defense and air dominance missions. These core technologies include fiber launchers; high brightness, high efficiency diode pump modules; and high power, high efficiency fiber amplifiers. In FY 2017, MDA, DARPA and the Air Force will complete a 30 kilowatt packaged Fiber Combined Laser (FCL) system at the Massachusetts Institute of Technology Lincoln Laboratory. The system consists of the laser, batteries and thermal device. MDA will also upgrade the Diode Pumped Alkali Laser (DPAL) testbed at Lawrence Livermore National Laboratory to conduct a 30 kilowatt demonstration with improved beam quality. In FY 2018, MDA will complete these final milestones and conclude the FFRDC laboratory high-powered directed energy laser activity.

The Agency will make the directed energy technology developed under this PE available to industry for incorporation into the Low Power Laser Demonstrator and for further laser scaling development to power levels required for robust, speed of light missile defense.

Divert and Attitude Control System (DACS) was transferred to PE 0603294C Common Kill Vehicle Technology beginning in FY 2018.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603178C / <i>Weapons Technology</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	51.153	71.843	69.004	-	69.004
Current President's Budget	50.263	71.843	5.495	-	5.495
Total Adjustments	-0.890	0.000	-63.509	-	-63.509
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.890	0.000			
• Other Adjustment	0.000	0.000	-63.509	-	-63.509

Change Summary Explanation

The decrease in FY18 reflects the transfer of Divert and Attitude Control System (DACS) to PE 0603294C Common Kill Vehicle Technology beginning in FY 2018.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603178C / <i>Weapons Technology</i>				Project (Number/Name) MD69 / <i>Directed Energy Research</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD69: <i>Directed Energy Research</i>	47.006	25.314	47.691	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

N/A

A. Mission Description and Budget Item Justification

The MDA mission is to develop a robust system to defend the United States against ballistic missile attacks at all ranges, in all phases of flight. Using Directed Energy weapons to negate a ballistic missile in boost phase, before a threat missile can deploy countermeasures, will revolutionize missile defense by dramatically reducing the role of interceptors. In FY 2010, the Airborne Laser program proved it is possible to acquire, track and destroy a boosting missile, addressing many aspects of the boost phase kill, but also underscoring the complexity and challenges of fielding such a weapon system. The experience gained from that successful first foray into directed energy system illuminates a new path that integrates a highly efficient, compact electric laser into a high altitude, low-Mach Unmanned Aerial Vehicle capable of flying in the stratosphere. Flying at low speed in relatively calm air at 60,000 feet significantly reduces the need for the complex beam pointing and atmospheric jitter compensation systems that were challenges for the Airborne Laser program. The key to realizing this future high altitude, unmanned directed energy system is the laser.

The Directed Energy Research project funds the laboratory development of two high energy laser technologies, the DPAL with Lawrence Livermore National Laboratory (LLNL) and FCL with the Massachusetts Institute of Technology Lincoln Laboratory (MIT/LL). Both laser technologies have considerable promise for scaling to very high average power while simultaneously achieving high system electrical-to-optical efficiencies, exceeding 40 percent, and very low system weight and volume.

The MDA strategy is to reduce technical risk through dual path laboratory development and transition the laboratory development to industry in FY 2018 for high altitude unmanned platform integration and test.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Directed Energy Research	FY 2016	FY 2017	FY 2018
	25.314	47.691	5.495
Description: Directed Energy Research funds two promising laser technologies: LLNL's DPAL and MIT/LL's FCL. Each technology takes a unique approach to attaining high power. The DPAL scales in power by increasing the size of a single laser gain cell. This approach has the benefit of simplicity of design, but must address very high energy levels within the single cell. LLNL successfully demonstrated over 16 kilowatts (kW) in FY 2016; will demonstrate 30 kW in FY 2017.			
MDA's key fiber laser investments are targeted at driving the weight per kilowatt of power in the fiber amplifier system down while increasing the individual fiber amplifier power output. MDA joined with DARPA and the Air Force to demonstrate 44 kW in a room-sized, 40 kilogram per kilowatt configuration in FY 2015, to a packaged 7 kilograms per kilowatt 30 kW system in FY 2017.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603178C / <i>Weapons Technology</i>	Project (Number/Name) MD69 / <i>Directed Energy Research</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> Based on multiple successful FCL 40 kilowatt (kW) demonstrations and DPAL 10 kW demonstrations, the increase from FY 2015 to FY 2016 funds increased laser test bed power, laser packaging demonstrations, system robustness and megawatt-class scaling designs.</p> <ul style="list-style-type: none"> - Upgraded the 10 kW DPAL laboratory demonstration system to a 30 kW-class test bed -- Conducted beam quality characterization testing to validate gain cell flow uniformity -- Validated gain cell waveguide scaling path to higher power operation -- Demonstrated improved robustness and reliability of pump diode modules - In collaboration with DARPA and the Air Force, completed the critical design review and began fabrication and integration of the 7 kilograms (kg) per kW low size weight and power FCL system -- Conducted FCL advanced beam combiner high power demonstration to verify the combiner can scale to required performance levels -- Analyzed and evaluated laboratory and industry high energy laser test data for scaling to ballistic missile defense system relevant power levels - Implemented directed energy models and simulations to assess technology capability against expected threats, define technology gaps and identify and mitigate technical risks -- In conjunction with HELJTO addressed real-time laser deconfliction procedures and implementation mechanisms <p><i>FY 2017 Plans:</i> The increase from FY 2016 to FY 2017 funds increased laser test bed power demonstrations, laser packaging demonstrations, and hundreds of kW class scaling designs based on successful > 40 kW FCL and > 30 kW DPAL system demonstrations</p> <ul style="list-style-type: none"> - Demonstrate 30 kW operation with 30% electrical-to-optical (E-O) efficiency - Upgrade the 30 kW DPAL system laboratory test bed -- Demonstrate a 30 kW DPAL beam with the ability to tightly focus on the target (beam quality at 1.5X diffraction-limited) --- Complete characterization of a deformable mirror beam correction system --- Integrate and test beam correction system -- Complete a preliminary design for a 120 kW DPAL system --- Initiate design for a 120 kW DPAL gain cell and pump delivery system - In collaboration with DARPA and the Air Force; upgrade the FCL system -- Deliver and demonstrate a flight qualified 1kg per kW compact fiber amplifier traceable to BMDS HEL system requirements -- Demonstrate a 7 kg per kW compact, packaged FCL system --- Conduct first light demonstration of the compact, packaged FCL system --- Conduct a 30 kW Low Size Weight and Power (SWaP) demonstration validating a 7 kg per kW integrated FCL package 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603178C / <i>Weapons Technology</i>	Project (Number/Name) MD69 / <i>Directed Energy Research</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
-- Conduct preliminary design reviews for a 50 kW low SWaP 5 kg per kW integrated FCL package			
<i>FY 2018 Plans:</i> The decrease from FY 2017 to FY 2018 reflects completion of final 30 kW milestone demonstrations and conclusion of the FFRDC laboratory high-powered directed energy laser activity. Work in FY 2018 include testing to anchor DPAL and FCL performance and scaling potential and generation of DPAL and FCL final reports.			
Accomplishments/Planned Programs Subtotals	25.314	47.691	5.495

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0604115C: <i>Technology Maturation Initiatives</i>	24.743	99.366	128.406	-	128.406	168.388	174.432	176.660	177.264	Continuing	Continuing

Remarks

D. Acquisition Strategy

The acquisition strategy for the MD69, Directed Energy Research, consists of partnering with Industry, the DARPA, the Air Force, Federally Funded Research and Development Centers and University Affiliated Research Centers. The MDA will leverage Agency and partner subject matter experts and use government model based assessments to inform Better Buying Power philosophy acquisition decisions. The MDA will then award contracts to industry and universities via the Advanced Technology Innovation Broad Agency Announcement and competitive procurements to develop and demonstrate promising components and integrated systems in realistic test environments.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603178C / <i>Weapons Technology</i>				Project (Number/Name) MD72 / <i>Interceptor Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD72: <i>Interceptor Technology</i>	58.953	22.818	22.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

Divert and Attitude Control System (DACS) will be funded from PE 0603294C Common Kill Vehicle Technology beginning in FY 2018.

A. Mission Description and Budget Item Justification

The Interceptor Technology project developed Divert and Attitude Control System (DACS) technology to enhance operational performance of future Multi-Object Kill Vehicle (MOKV). Technology investment focused on DACS subsystem and system elements that support longer operation, multiple discrete DACS firing events, precision attitude control, safe operation and minimum kill vehicle mass. In FY 2017, MDA continued investment in a competitive next generation solid DACS development with industry to reduce propulsion component risk for the MOKV. The concept(s) developed for MOKV application transitioned to implementation with the industry MOKV developers. MDA continued to conduct testing of lightweight, long duration Cooled Gas and Multi-Pulse Attitude Control Systems having application to both a Kill Vehicle and a Third Stage Rocket Motor, while anchoring system sizing and performance prediction models. MDA defined the baseline requirements using analytical tools to identify mature technology capable of supporting MOKV development.

The project also modeled and assessed electromagnetic rail gun projectile technology readiness, suitability, and integration requirements for ballistic missile defense applications.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
Title: Interceptor Technology	22.818	22.000	0.000
Description: Interceptor Technology focuses on development and test of component and sub-systems for a solid propulsion DACS, including propellant tanks, Attitude Control System and divert thrusters, and pressurant subsystems. This project will also investigate electromagnetic rail gun suitability and integration requirements for ballistic missile defense applications. This is a continuation of systems engineering and analysis that began under the BMD Enabling Programs program element, 0603890C in FY 2014.			
FY 2016 Accomplishments:			
- Delivered initial design of a next generation solid DACS technology concept(s) that support multiple object kill vehicle development			
- Conducted initial government review and assessment of contractor(s) concepts to determine utility of alternative technology			
- Initiated component development testing to support government assessment and finalize concept design			
- Conducted government review and update assessment of contractor's final concept(s) to identify remaining gaps			
- Investigated preliminary rail gun projectile technology suitability for ballistic missile defense applications			
FY 2017 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603178C / <i>Weapons Technology</i>	Project (Number/Name) MD72 / <i>Interceptor Technology</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
- Conduct DACS technology development and testing to further reduce propulsion component risk for industry MOKV concept development - Conduct component testing of lightweight, long duration Cooled Gas Attitude Control System - Investigate rail gun projectile technology suitability for ballistic missile defense applications FY 2018 Plans: DACS development will be funded from PE 0603294C Common Kill Vehicle Technology beginning in FY 2018.			
Accomplishments/Planned Programs Subtotals	22.818	22.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0604894C: <i>Multi Object Kill Vehicle</i>	0.000	71.513	6.500	-	6.500	3.500	229.524	209.830	265.898	0	786.765

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603178C / <i>Weapons Technology</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	0.705	2.131	2.152	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603179C / <i>Advanced C4ISR</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	25.870	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	39.157
MD73: <i>Advanced C4ISR</i>	25.191	9.197	3.462	0.000	-	0.000	0.000	0.000	0.000	0.000	0	37.850
MD40: <i>Program-Wide Support</i>	0.679	0.464	0.164	0.000	-	0.000	0.000	0.000	0.000	0.000	0	1.307

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

For FY18 and beyond, the discrimination technologies developed under this PE have been transitioned to the Ballistic Missile Defense Sensors (0603884C) Program Element for further refinement and implementation.

The Advanced Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Program Element develops future BMDS capabilities to out-pace emerging and evolving threats and identifies, develops, and readies for transition the technical solutions that address shortfalls identified by the Combatant Commanders. MDA uses the Prioritized Capabilities List (PCL) and the Agency's Achievable Capabilities List (ACL) to prioritize technology investments including Advanced C4ISR. MDA's investments balance the pursuit of promising next generation technology with the need for near-term solutions to enhance existing BMDS capability.

This Program Element also included support for C2BMC centric discrimination improvements for Near-Term and Mid-Term capability fielding. MD40 Program-Wide Support (PWS) consists of essential non-headquarters management efforts providing integrated and efficient support to MDA functions and activities across the entire BMDS.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603179C / <i>Advanced C4ISR</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	9.876	3.626	0.000	-	0.000
Current President's Budget	9.661	3.626	0.000	-	0.000
Total Adjustments	-0.215	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.215	0.000			
• Other Adjustment	0.000	0.000	0.000	-	0.000

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603179C / <i>Advanced C4ISR</i>	Project (Number/Name) MD73 / <i>Advanced C4ISR</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD73: <i>Advanced C4ISR</i>	25.191	9.197	3.462	0.000	-	0.000	0.000	0.000	0.000	0.000	0	37.850

Note
The decrease in FY 2017 is due to the completion of technology development efforts.

A. Mission Description and Budget Item Justification

Advanced Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) enables rapid, exponential capability increases in the Ballistic Missile Defense System (BMDS) command, control, battle management and communications (C2BMC) and existing sensor networks. MDA will develop and mature technology, software and algorithms to facilitate integration of Service command and sensor network approaches into the BMDS.

This Program Element also included support for C2BMC centric discrimination improvements for Near-Term and Mid-Term capability fielding. For FY18 and beyond, the discrimination technologies developed under this PE have been transitioned to the Ballistic Missile Defense Sensors (0603884C) Program Element for further refinement and implementation.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
Title: Advanced X-Band Radar Capabilities	9.197	3.462	0.000
Description: Development and incorporation of advanced discrimination algorithms into X-Band Radars (XBRs). Specific and/or unique accomplishments to each FY are as follows:			
FY 2016 Accomplishments: -Initiated incorporation of advanced discrimination algorithms into XBRs, planned for completion in FY 2017			
FY 2017 Plans: -Complete development of advanced discrimination algorithms for XBR and AN/TPY-2 radars -Complete transition of technology to the BMD Sensors (0603884C) program element. Mid-term discrimination improvements are planned to field in FY 2019			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	9.197	3.462	0.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603179C / <i>Advanced C4ISR</i>	Project (Number/Name) MD73 / <i>Advanced C4ISR</i>
--	---	--

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603898C: <i>Ballistic Missile Defense Joint Warfighter Support</i>	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing

Remarks

D. Acquisition Strategy

Advanced X-Band Radar Capabilities follow the MDA capability-based acquisition strategy that emphasizes testing, development and evolutionary acquisition. The advanced technology development will include development of target acquisition and discrimination algorithms and assessment of performance. Performance assessment and transition risk reduction will use modeling, simulation, and online or offline assessment of live tracking opportunities. When ready, technology will transition to appropriate program elements for advanced component development and integration into BMDS X-Band Radars.

The Radar Sustainment Contract (RSC) will be used for both advanced technology development and for transition of technology to systems. The RSC is an Indefinite Delivery/Indefinite Quantity (IDIQ) task order contract awarded in 2012 to sustain all the BMDS X-Band Radars. The contract provides sustainment of previously developed X-Band radar products, such as:

- Software maintenance of existing software developed to support the X-Band Radars
- Models & Simulation - development, maintenance, and verification of high fidelity models, support for war games and exercises, and support for performance assessment events
- Engineering Services - engineering support for deployed radars to facilitate maintenance efforts which may include but are not limited to hardware obsolescence studies, hardware redesign, technology insertion, and refurbishment efforts

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
0400 / 3	PE 0603179C / <i>Advanced C4ISR</i>	MD73 / <i>Advanced C4ISR</i>

-BMDS Test Planning, Execution, and Analysis - planning, execution and analysis of BMDS test requirements for previously developed hardware and software in accordance with the MDA Integrated Master Test Plan (IMTP).

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603179C / <i>Advanced C4ISR</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	0.679	0.464	0.164	0.000	-	0.000	0.000	0.000	0.000	0.000	0	1.307

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	41.005	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
MD25: <i>Advanced Technology Development</i>	41.005	16.061	26.900	19.302	-	19.302	19.723	20.580	20.905	21.319	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	-	0.926	0.833	0.882	-	0.882	0.972	0.975	1.031	1.042	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The Advanced Research PE conducts leading edge advanced research and development to create and enable future missile defense capabilities. Missile Defense Agency executes this mission by capitalizing on the creativity and innovation of the brightest minds in our Nation's universities and small businesses, collaborative research partnerships between allied country academic institutions, and innovative ideas from industry. This includes a focus on facilitating the transition of technology to the Ballistic Missile Defense System (BMDS) through a Commercialization and Transition Office and the execution of the Rapid Innovation Fund Program.

FY 2017 Amended Budget Request Justification: \$+4.300M is required to address Joint Emergent Operational Need requirement to ensure readiness of the BMDS. \$ +4.300M Project MD25 - Advanced Technology Development/Advanced Research to begin FY 2017 National Defense Authorization Act (NDAA) required development of a Hypersonic Threat Defense program. Leverages Army Night Vision Lab and other Services' investments in large Focal Panel Arrays (FPA) that can maintain high sensitivity at higher operating temperature.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	17.364	23.433	19.870	-	19.870
Current President's Budget	16.987	27.733	20.184	-	20.184
Total Adjustments	-0.377	4.300	0.314	-	0.314
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.377	0.000			
• Other Adjustment	0.000	4.300	0.314	-	0.314

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>
---	--

Change Summary Explanation

FY 2017 Amended Budget Request Justification: \$+4.300M is required to address Joint Emergent Operational Need requirement to ensure readiness of the BMDS.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>				Project (Number/Name) MD25 / <i>Advanced Technology Development</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD25: <i>Advanced Technology Development</i>	41.005	16.061	26.900	19.302	-	19.302	19.723	20.580	20.905	21.319	Continuing	Continuing

Note

N/A

A. Mission Description and Budget Item Justification

MDA explores potential new BMDS capabilities by leveraging the creativity and innovation of the Nation's small businesses and universities to conduct advanced technology development. MDA also pursues advanced technology development through cooperative international research agreements between U.S. and foreign universities of allied nations. The program manages the selection process and administers the Missile Defense Small Business Innovation Research program element, 0605502C. Small Business Innovation Research topics and projects are selected annually based on identified needs across the BMDS and executed in partnership with sponsoring intra-agency organizations.

MDA's Advanced Technology Development Project pursues a broad range of emerging technology targeted for application and insertion into the BMDS. This work facilitates the commercialization and transition of promising technology into the BMDS by promoting a cooperative environment to reduce cost and increase return on investment between small business, prime contractors, and MDA elements.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Advanced Research	FY 2016	FY 2017	FY 2018
Description: This activity funds technology/research initiatives. Specific and/or unique accomplishments to a FY are as follows: -Conduct systems engineering, integration, research, and material solution analysis to identify initiatives and technology to include missiles, sensors, and command and control components in the defense against current and future threats -Leverage university to university international research opportunities with allied nations to enhance BMDS advanced technology initiatives and build stronger relationships with MDA North Atlantic treaty Organization allied nations and our partner countries -Manage the selection process of Small Business Innovation Research and Technology Applications programs to assist MDA-funded technology developers in finding and entering technology transfer opportunities to missile defense applications	16.061	26.900	19.302
FY 2016 Accomplishments: -Pursued on-going scientific and engineering university research initiatives and projects: --Texas A&M University: Solid Propellant Additives for Divert Attitude Control System (DACs) Applications --Texas A&M University: Hybrid Waveguide Micro Electro Mechanical System Optical Signal Processor --Alabama A&M University: Reconfigurable Computing for Multi-Sensor Tracking Applications --University of Texas at Austin: Nanomaterial-based Ink-Jet Printing Science and Technology for Conformable X-			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>	Project (Number/Name) MD25 / <i>Advanced Technology Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Band Phased Array Antenna</p> <ul style="list-style-type: none"> --University of New Hampshire: Gas Circulator for Diode Pumped Alkali Laser (DPAL) --University of Connecticut: Development of Innovative Solutions for Hardware Security, and Detection and Prevention -- University of New Hampshire: Numerical Simulations of DPAL with Co-Flowing Planar Jet Geometries -- Auburn University / Middle East Technical University, Turkey: Integrated Framework for Engineering Replicability into High Assurance Ballistic Missile Defense System (BMDS) Simulations <p>-Sponsored breakthrough technology and innovative solutions from private industry, qualified accredited domestic educational institutions, and nonprofit organizations, using the Advanced Technology Innovation Broad Agency Announcement, to include research in:</p> <ul style="list-style-type: none"> -- Radar Systems -- Directed Energy Systems -- Electro-Optical Infrared Sensor Systems -- Computer Science, Signal and Data Processing -- Mechanical and Aerospace engineering -- Decision Theory -- Modeling & Simulation -- Interceptor Technology -- Sensor Technology <p>-Partnered with industry, the High Energy Laser Joint Technology Office, universities and national laboratories through advanced technology initiatives to improve sensor technology, high energy laser acquisition, tracking, and pointing technology, and lightweight fiber laser amplifiers</p> <p>FY 2017 Plans:</p> <p>The increase in funding from FY 2016 to FY 2017 provides additional funding to the highly successful effort for transitioning advanced material technology to the BMDS, along with initiatives in Nano-technology (propellants, batteries, electronics, multifunctional structures, thermal management, and electro-optics) and additive manufacturing technology for interceptor propulsion and structural components.</p> <p>-Partner with industry, universities, and national laboratories through advanced technology initiatives:</p> <ul style="list-style-type: none"> --Nano-technology initiatives ---Propellants ---Batteries 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>	Project (Number/Name) MD25 / <i>Advanced Technology Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>---Electronics ---Multifunctional structures ---Thermal management ---Electro-optics --Additive manufacturing technology initiatives for interceptor propulsion and structural components</p> <p>-Pursue on-going scientific and engineering university research initiatives and projects, including: --Alabama A&M University: Reconfigurable Computing for Multi-Sensor Tracking Applications --Auburn University / Middle East Technical University, Turkey: Integrated Framework for Engineering Replicability into High Assurance BMDS Simulations --Howard University: Machine Learning for Analyzing the Forensics and Reliability of Integrated Circuits --Johns Hopkins University: Improvements in Thermal Battery Capabilities --Purdue University: Development and Characterization of Hypergolic Propellants --Purdue University: Investigation of Root Causes of Combustion Instability --Texas A&M University: Propellant Formulations for Suppressing Combustion Instability in Solid Rocket Motors --Texas A&M University: Hysteresis Engineering of Adaptive Materials for Electronic and Optoelectric Devices --University of Connecticut: Radar and Electro Optical Systems Track Detection Algorithms --University of Dayton: Common Aperture Light Weight Multi-Aperture All Electric High Energy Laser --University of Michigan: Narrow-Band Infrared Spectral Filtering via Silicon Sub-Wavelength Dielectric Gratings --University of Nebraska / University of Bordeaux, France: Diamond Coating Adaptive to Substrate Materials --University of Texas El Paso: Hydroxyl Ammonium Nitrate Based Advanced Hybrid Rocket Motor Technologies --Washington State University: Reliability of Through Silicon Vias and Solder Microbumps in 3D Electronics for High Performance Defense Applications</p> <p>-Sponsor breakthrough technology and innovative solutions from private industry, qualified accredited domestic educational institutions, and nonprofit organizations, using the Advanced Technology Innovation Broad Agency Announcement, to include research in: -- Radar systems -- Directed energy systems -- Electro-optical infrared sensor systems -- Computer science, signal, and data processing -- Mechanical and aerospace engineering -- Decision theory -- Modeling & simulation</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>	Project (Number/Name) MD25 / <i>Advanced Technology Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> -- Interceptor technology -- Sensor technology -Partner with industry, universities and national laboratories through advanced technology initiatives to develop improvements, including: <ul style="list-style-type: none"> --Space and sensor technology --Nanosat technology demonstrations --Radiation hardened mirror technology --Multi-static radar technology to include interferometric processing --Radiation hardened strained-layer superlattice focal plane arrays --Improvements in spacecraft manufacturing efficiency --Deep learning algorithms for missile discrimination --Directed energy technology --High power optical fibers --Quick recovery high energy diodes --Ultra low size weight and power diode pump modules --Large stroke, high spatial bandwidth, deformable mirrors --Light weight, dampened optical benches --Optics and coatings for alkali environments --Interceptor technology --Aerospace-grade Rayon technology development --Liquid bipropellant combustion models --Liquid propellant neutralization --Navigation algorithm technology development --Future Ballistic Missile Defense System concept development --Advanced sensor algorithm initiative --Aerospace vehicle target, tracking, and discrimination --Radar interferometric processing for electro magnetic rail gun --Low cost sensor development for Advanced Threat Tracking --Leverage Army Night Vision Lab investments in large focal plane arrays that maintain high sensitivity at higher operating temperatures and other technology investments in wide field of view optics --Produce and demonstrate a breadboard 4k x 4k strained layer superlattice focal plane arrays and wide field of view optics 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>	Project (Number/Name) MD25 / <i>Advanced Technology Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>-Continue an International Cooperative Agreement between the DoD and the Ministry of Defense of the Kingdom of Denmark concerning ballistic missile defense technology (Frequency Modulated Continuous Wave Radar project) to determine the utility of high-resolution range/range-rate radar technology for ballistic missile defense applications</p> <p>FY 2018 Plans:</p> <p>-Partner with industry, universities and national laboratories through advanced technology initiatives to develop improvements, including:</p> <ul style="list-style-type: none"> --Nano-technology initiatives ---Propellants ---Batteries ---Electronics ---Multifunctional structures ---Thermal management ---Electro-optics --Additive manufacturing technology initiatives for interceptor propulsion and structural components --Space and sensor technology ---Nanosat technology demonstrations ---Radiation hardened mirror technology ---Radiation hardened strained-layer superlattice focal plane arrays ---BMDS nosecone test program to mature nosecone manufacturing technology to a high technology readiness level for implementation into the BMDS ---4D carbon-carbon manufacturing process addressing obsolescence issue ---Next generation seeker window development ---Deep learning algorithms for missile discrimination --Directed energy technology ---High power optical fibers ---Quick recovery high energy diodes ---Ultra low size weight and power diode pump modules ---Large stroke, high spatial bandwidth, deformable mirrors ---Light weight, dampened optical benches ---Optics and coatings for alkali environments --Interceptor technology ---Aerospace-grade Rayon technology development ---Liquid bipropellant combustion models ---Liquid propellant neutralization 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>	Project (Number/Name) MD25 / <i>Advanced Technology Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>---Navigation algorithm technology development</p> <p>--Future Ballistic Missile Defense System concept development</p> <p>---Advanced sensor algorithm initiative</p> <p>---Aerospace vehicle target, tracking, and discrimination</p> <p>---Radar interferometric processing for electro magnetic rail gun</p> <p>-Pursue on-going scientific and engineering university research initiatives and projects, including:</p> <p>--Johns Hopkins University: Improvements in Thermal Battery Capabilities</p> <p>--North Carolina State University/Czech Tech University: Space Debris Exploration: Modeling and Fusion Algorithms</p> <p>--Penn State University: Development of High Performance W-Based Alloys with Sub-Grained Microstructure by Field Assisted Sintering Technology for Rocket Nozzles:</p> <p>--Purdue University: Development and Characterization of Hypergolic Propellants</p> <p>--Purdue University: Investigation of Root Causes of Combustion Instability</p> <p>--Purdue University: Reliability Risk Management of Gold Contaminated Tin-Lead and Lead-Free Solder Joints in Military Electronics</p> <p>--Texas A&M University: Propellant Formulations for Suppressing Combustion Instability in Solid Rocket Motors</p> <p>--Texas A&M University: Hysteresis Engineering of Adaptive Materials for Electronic and Opto-Electric Devices</p> <p>--University of Michigan: Narrow-Band Infrared Spectral Filtering via Silicon Sub-Wavelength Dielectric Gratings</p> <p>--Washington State University: Reliability of Through Silicon Vias and Solder Microbumps in 3D Electronics for High Performance Defense Applications</p> <p>-Sponsor breakthrough technology and innovative solutions from private industry, qualified accredited domestic educational institutions, and nonprofit organizations, using the Advanced Technology Innovation Broad Agency Announcement, to include research in:</p> <p>-- Radar Systems</p> <p>-- Directed Energy Systems</p> <p>-- Electro-Optical Infrared Sensor Systems</p> <p>-- Computer Science, Signal, and Data Processing</p> <p>-- Mechanical and Aerospace engineering</p> <p>-- Decision Theory</p> <p>-- Modeling & Simulation</p> <p>-- Interceptor Technology</p> <p>-- Sensor Technology</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>	Project (Number/Name) MD25 / <i>Advanced Technology Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
-Continue an International Cooperative Agreement between the DoD and the Ministry of Defense of the Kingdom of Denmark concerning ballistic missile defense technology (Frequency Modulated Continuous Wave Radar project) to determine the utility of high-resolution range/range-rate radar technology for ballistic missile defense applications			
Accomplishments/Planned Programs Subtotals	16.061	26.900	19.302

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603294C: <i>Common Kill Vehicle Technology</i>	60.851	0.000	252.879	-	252.879	321.175	110.934	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

The acquisition strategy to conduct these technology development agreements consists of partnering with accredited domestic universities, small businesses, and nonprofit organizations. MDA awards competitive procurements via the MDA Science and Technology Advanced Research Broad Agency Announcement; the Advanced Technology Innovation Broad Agency Announcement; the Small Business Innovation Research program; and the Small Business Technology Transfer program.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603180C / <i>Advanced Research</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	-	0.926	0.833	0.882	-	0.882	0.972	0.975	1.031	1.042	Continuing	Continuing

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603274C / <i>Special Program - MDA Technology</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	173.558	9.650	83.745	0.000	-	0.000	0.000	0.000	0.000	0.000	0	266.953
MD81: <i>Special Programs - MDA Technology</i>	173.558	9.650	83.745	0.000	-	0.000	0.000	0.000	0.000	0.000	0	266.953

Program MDAP/MAIS Code: 362

Note

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	13.908	83.745	0.000	-	0.000
Current President's Budget	9.650	83.745	0.000	-	0.000
Total Adjustments	-4.258	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-3.941	0.000			
• SBIR/STTR Transfer	-0.317	0.000			
• Other Adjustment	0.000	0.000	0.000	-	0.000

Change Summary Explanation

FY 2016 Reprogramming supported Special Programs Missile Defeat. Further details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

In FY 2018, efforts will transition to PE 0603891C. This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	92.632	60.851	0.000	252.879	-	252.879	321.175	110.934	0.000	0.000	Continuing	Continuing
MD85: <i>Common Kill Vehicle Technology</i>	91.320	58.656	0.000	249.915	-	249.915	315.619	107.734	0.000	0.000	Continuing	Continuing
MD40: <i>Program Wide Support</i>	1.312	2.195	0.000	2.964	-	2.964	5.556	3.200	0.000	0.000	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

All FY 2017 Multi Object Kill Vehicle (MOKV) efforts were requested in the BA-4 0604894C Program Element. Beginning in FY 2018, MOKV BA-3 risk reduction and technology development efforts are requested in this BA-3 Common Kill Vehicle Technology program element 0603294C; MOKV product development is requested in the BA-4 Multi Object Kill Vehicle program element 0604894C.

A. Mission Description and Budget Item Justification

The Multi Object Kill Vehicle program will enhance interceptor performance to enable the Warfighter to counter more numerous and complex threats to the homeland by establishing the technological foundation for engaging multiple objects from a single interceptor. The Missile Defense Agency (MDA) is developing the concepts for a MOKV based on a modular, open systems architecture designed to common interfaces and standards, making upgrades easier and broadening MDA's vendor and supplier base. The MOKV will rely on a BMDS architecture that balances performance across the sensor, Command, Control, Battle Management and Communications, and kill vehicle elements. Analysis shows that having multiple kill vehicles on each interceptor can dramatically improve the performance of the system, significantly reduce the burden on interceptor inventory, and reduce cost to defend the Homeland.

This funding provides technology risk reduction

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	61.753	0.000	0.000	-	0.000
Current President's Budget	60.851	0.000	252.879	-	252.879
Total Adjustments	-0.902	0.000	252.879	-	252.879
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.902	0.000			
• Other Adjustment	0.000	0.000	252.879	-	252.879

Change Summary Explanation

The increase from PB17 to PB18 in FY2018 is for additional Multi-Object Kill Vehicle technology risk reduction.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i>	Project (Number/Name) MD85 / <i>Common Kill Vehicle Technology</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
<i>MD85: Common Kill Vehicle Technology</i>	91.320	58.656	0.000	249.915	-	249.915	315.619	107.734	0.000	0.000	Continuing	Continuing

Note

N/A

A. Mission Description and Budget Item Justification

MDA will focus on competitive development and risk reduction of Multi Object Kill Vehicle (MOKV) components and subsystems with industry in FY 2018.

MDA has implemented a structured, disciplined systems engineering process to assure the MOKV is a Ballistic Missile Defense System (BMDS) solution. The systems engineering effort will define; the requirements for a deployable MOKV, the exit requirements for the technology component and subsystem risk reduction phase; and the entrance criteria for a future development phase. The Government will develop MOKV system engineering guidelines from industry concepts, government analysis, modeling, and simulation. The MOKV concepts and identified technology component risk reduction will formulate the trade space across cost, risk, and kill vehicle performance to establish requirements that are feasible and affordable for the engineering, manufacturing and development of a future MOKV. MDA anticipates deploying this capability across the interceptor fleet in the next decade to address the evolving threat.

This capability relies on a BMDS architecture that balances performance across the sensor; Command, Control, Battle Management and Communications; and kill vehicle elements. Analysis shows that having multiple kill vehicles on each interceptor can dramatically improve the performance of the system, significantly reduce the burden on interceptor inventory, and reduce cost to defend the Homeland.

As part of MOKV concept development, industry identified technology component risk reduction efforts that support their concepts. In FY 2018, MDA will continue risk reduction for selected kill vehicle and carrier vehicle component and subsystem technologies that lower development risk, leading to follow-on integrated prototype demonstrations. MOKV technology risk reduction efforts include engagement management, communications, seekers and advanced sensors, divert attitude and control systems, integrated avionics, and inertial measurement units.

As part of further enhancing MOKV component risk reduction, kill vehicle and carrier vehicle subsystems will be matured to fully operable prototypes and integrated together to conduct high-fidelity hardware-in-the-loop laboratory demonstrations of performance, functionality and interfaces.

A number of components will be integrated into the kill vehicle prototype demonstrators to show operating functions and performance against simulated threats. Avionics will demonstrate relevant through put and navigation accuracy. Seeker telescope and sensor packaging will confirm frame rate speed, and achieve pixel density and sensitivity to acquire and track threat objects. Communication and antenna packaging will indicate transmission power and receiver sensitivity sufficiency, in conjunction with the viewing angles that will be encountered in an operational environment. Divert and attitude control system will demonstrate the thrust and divert capabilities that are necessary, in conjunction with seeker packaging and performance, to perform lethal engagements against a designated threat object.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i>	Project (Number/Name) MD85 / <i>Common Kill Vehicle Technology</i>

A prototype demonstrator for the carrier vehicle, on which the kill vehicles will reside, will integrate an adjunct seeker telescope and sensor components to show larger format focal plane array sensitivity for object detection. Communication and real time engagement management operations will be tested to establish capabilities to optimally manage threat object identification and hand off target assignments to the kill vehicles.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
<p>Title: Common Kill Vehicle</p> <p>Description: Competitive risk reduction and development of Multi Object Kill Vehicle (MOKV) concepts with industry. In FY 2018, funding for MOKV risk reduction is requested in this BA-3 Common Kill Vehicle Technology program element 0603294C and the MOKV development is requested in the BA-4 Multi Object Kill Vehicle program element 0604894C.</p> <ul style="list-style-type: none"> - Conduct technology risk reduction for selected component and subsystem technologies that lower development risk. Potential candidate MOKV technology risk reduction efforts include engagement management, kill vehicle-to-kill vehicle communications, advanced sensor, propulsion systems, and inertial measurement units - Refine and update government MOKV concepts for independent performance predictions via government simulations to establish baseline for contractor concept assessments - Continue development of MOKV engagement management algorithms to analyze and characterize government concepts for managing the many-on-many engagement challenges due to complex threats - Conduct independent engagement management test framework to test and analyze industry concept performance, identify algorithm risk issues, confirm risk reduction progress, and enable continued Agency's MOKV requirements development - Continue to build, assemble, and test initial inertial measurement unit prototype to support final design, prototype fabrication, and model validation - Conduct planning for integrated demonstration test events focused on critical functions to validate reduction of technical risk - Define the requirements for a deployable MOKV using a structured, disciplined systems engineering process <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - MOKV Industry Contractors delivered initial concepts and modeling parameters for preliminary government assessment - Initiated development of the MOKV engagement management algorithms to address managing the many-on-many engagement challenges due to complex threats - Updated and refined government MOKV concept for independent performance predictions via government simulations to initiate contractor concept assessments - Built, assembled, and tested initial inertial measurement unit prototype to support model validation - Initiated design and analysis of a high band width software defined radio to support kill vehicle-to-kill vehicle and kill vehicle-to-ground communications <p>FY 2017 Plans:</p>	58.656	0.000	249.915

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i>	Project (Number/Name) MD85 / <i>Common Kill Vehicle Technology</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
see above			
FY 2018 Plans: see above			
Accomplishments/Planned Programs Subtotals	58.656	0.000	249.915

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0604894C: <i>Multi Object Kill Vehicle</i>	0.000	71.513	6.500	-	6.500	3.500	229.524	209.830	265.898	0	786.765

Remarks

D. Acquisition Strategy

The acquisition strategy consists of three focus areas. First, through competition with missile integration contractors, develop kill vehicle architectures and interfaces with competitive design of multi-object kill concepts incorporating engagement management concept of operations, kill vehicles and enhanced discrimination capability. Second, conduct risk reduction activities to identify and mature the technology necessary to increase the reliability and performance of our kill vehicles using the Advanced Technology Innovation Broad Agency Announcement and competitive procurements. Make investments that mitigate the component development gaps for future Multi-Object Kill Vehicles, and enhance the competitive environment. Make the necessary investments to maturing component technology; enhanced inertial navigation and kill vehicle-to-kill vehicle communications. Third, leverage the technical expertise of Federally Funded Research and Development Centers, University Applied Research Centers, and Universities and government laboratories to independently develop reference concept using proven modeling/analysis techniques.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program Wide Support</i>	1.312	2.195	0.000	2.964	-	2.964	5.556	3.200	0.000	0.000	Continuing	Continuing

Note

N/A

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Program Wide Support	FY 2016	FY 2017	FY 2018
Description: N/A	2.195	0.000	2.964
FY 2016 Accomplishments: N/A			
FY 2017 Plans: - In FY 2017, Program Wide Support was proportionately reallocated as a result of the Common Kill Vehicle Technology transfer to the Multi Object Kill Vehicle, Program Element 0604894C.			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	2.195	0.000	2.964

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603294C / <i>Common Kill Vehicle Technology</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1,141.624	197.617	209.072	230.162	-	230.162	194.328	253.778	264.377	267.254	Continuing	Continuing
MD07: <i>THAAD</i>	1,068.268	186.100	192.699	215.569	-	215.569	176.302	230.270	239.792	244.604	Continuing	Continuing
MC07: <i>Cyber Operations</i>	1.188	0.572	5.605	3.325	-	3.325	7.563	10.595	10.686	8.698	Continuing	Continuing
MD06: <i>Patriot Advanced Capability-3 (PAC-3)</i>	6.486	1.066	1.130	1.162	-	1.162	1.171	1.245	1.264	1.290	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	65.682	9.879	9.638	10.106	-	10.106	9.292	11.668	12.635	12.662	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

The increase from FY 2017 to FY 2018 provides increased THAAD Software Build 4.0 development.

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense (BMD) Terminal Defense Segment provides vital forward-deployable capabilities to support Regional defensive BMD operations. The Terminal High Altitude Area Defense (THAAD) system provides Combatant Commanders a globally-transportable, rapidly-deployable capability to intercept and destroy short-range, medium-range, and limited intermediate-range ballistic missile threats inside or outside the atmosphere during terminal phase of flight. Continued development and integration will provide enhanced debris mitigation capability, improved interoperability with other BMDS elements, and training devices to support the THAAD Institutional Training Base.

This Program Element also investigates concepts and performs systems engineering to address hypersonic threats.

FY 2017 Amended Budget Request Justification: \$+2.238M is required to address emergency warfighting readiness requirements to ensure readiness of the BMDS. \$ +2.238M Project MC07-Cyber Operations/BMDS Cyber Operations to implement improvements for General Service systems to strengthen Cybersecurity posture while concurrently streamlining the IT operating environment.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	212.230	206.834	231.105	-	231.105
Current President's Budget	197.617	209.072	230.162	-	230.162
Total Adjustments	-14.613	2.238	-0.943	-	-0.943
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-9.999	0.000			
• SBIR/STTR Transfer	-4.614	0.000			
• Other Adjustment	0.000	2.238	-0.943	-	-0.943

Change Summary Explanation

FY 2017 Amended Budget Request Justification: \$+2.238M is required to address emergency warfighting readiness requirements to ensure readiness of the BMDS.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD07: <i>THAAD</i>	1,068.268	186.100	192.699	215.569	-	215.569	176.302	230.270	239.792	244.604	Continuing	Continuing
Quantity of RDT&E Articles	50	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2017 to FY 2018 provides increased THAAD Software Build 4.0 development efforts.

A. Mission Description and Budget Item Justification

The THAAD II Development Program consists of multiple, independent software builds (e.g. Build 2.0, Build 3.0, build 4.0, and build 5.0) to expand the capability of the previously delivered THAAD 1.0 system. THAAD software build 3.0 is scheduled to be completed in 3Q FY 2018 and tested in 2Q FY 2019 during Flight Test Operational-03 Event 2 (FTO-03 E2). THAAD software build 4.0 is scheduled to be completed in 2Q FY 2020 and tested in 3Q FY 2020 during Flight Test THAAD-19 (FTT-19). THAAD software build 5.0 is scheduled to be completed in 2Q FY 2021 and tested in 4Q FY 2021 during Flight Test THAAD-21 (FTT-21).

New capabilities provided from the different software builds of the THAAD II Development Program include upgrades such as:

- 1) improved THAAD Weapons System performance in the presence of a high debris environment,
- 2) expanded defended area footprints via remote operation of THAAD Launchers,
- 3) enhancements to share defended assets between BMD tactical level weapon systems,
- 4) software upgrades to maintain capability against evolving threats,
- 5) upgrades to process C2BMC messages to obtain direction for target engagement,
- 6) Weapon System Information Assurance mandatory updates,
- 7) Warfighter requested enhancements,
- 8) improved capability to engage SRBM, MRBM and limited IRBM threats capable of creating complex scenes,
- 9) upgrades to maintain interfaces with other BMDS elements, and
- 10) providing the ability to initiate an engagement and launch THAAD interceptors using sensor data provided by BMDS sources outside the THAAD Battery.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Terminal High Altitude Area Defense (THAAD) Development	124.769	124.616	163.006
Articles:	-	-	-
Description: Development of the THAAD II program as a series of independent, parallel software builds (e.g. Build 2.0, Build 3.0, build 4.0, and build 5.0) to deliver enhanced system capabilities and expand defense of allies and deployed forces from short-to-medium-range threats.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Additionally, in FY 2016 MDA conducted studies to identify needed improvements to the regional BMDS capabilities. As a result of the study, content related to emerging threats that present challenging complex scenes were deemed mature enough to pursue mitigation solutions. This content was moved from THAAD Follow-on and included in the baselined THAAD II Development Program as "Electronic Protection/Objective Debris Mitigation" part of software build 4.0, and has subsequently moved to the accomplishment "THAAD Development".</p> <p>Recurring efforts to support software development include:</p> <ul style="list-style-type: none"> - Support Models and Simulations (M&S) related activities in element and BMDS test events in the approved Integrated master Test Plan (IMTP) such as; requirements, design, development, and verification/validation and accreditation, - Design, develop, test, and field the releases of THAAD system software to ensure continued performance and operation of fielded batteries, - Provide software updates in support of performance upgrades, - Support laboratory assets and equipment to enable future development, and to isolate, identify, and remedy root causes of equipment and software deficiencies identified by the warfighter, - Perform requirements development, engineering analysis, and performance verification for THAAD development and BMDS integration to ensure THAAD compliance with the Ballistic Missile Defense (BMD) System Specification, BMD System Description Document, and Master Integration Plan, - Participate in MDA and Army studies to determine the architecture and integration of the THAAD Weapon system into the Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS), and - Provide and coordinate analysis, studies and papers to support the resolution of issues and concerns with the integration of the THAAD weapon system into the future Army IBCS architecture. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Continued development of Phase II debris mitigation functionality and integration into the weapon system to improve interoperability with other BMDS elements. - Began mitigating the effects of Track ID Proliferation through the implementation of BMDS changes approved in MIL-STD-6016 Interface Change Proposals (ICPs) in coordination with Aegis BMD, Command and Control, Battle Management, and Communications (C2BMC) and MDA Engineering. - Continued system performance and requirement studies to assess capability development plans. - Performed Information Assurance Vulnerability Assessments (IAVA) to mitigate potential system vulnerabilities and to ensure continued performance and operation of fielded batteries. - Updated THAAD software and hardware to ensure compliance with Department of Defense (DoD) Weapon System Information Assurance Programs and guidance. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Initiated the incremental transition of software support from the Prime Contractor to AMRDEC to reduce total system life cycle costs. - Initiated systems engineering and software development for THAAD and AN/TPY-2 Radar Electronic Protection / Objective Debris Mitigation capability including requirements development, modeling and simulation updates, and algorithm design and prototyping. The development will provide an improved capability to engage SRBM, MRBM and IRBM threats capable of creating complex scenes. - Continued development of packaged threat products to enable deployed and fielded batteries to upload new data on threat missiles as they evolve without updating the entire tactical software package. This will allow the THAAD weapon system to be updated on threats missiles more frequently. - Continued updating performance characteristics of threat missiles to be included in the packaged threat products update. Updated threat characteristics are based on intelligence data and will optimize THAAD weapon system performance against enhanced threats. - Initiated the development and coordination of the THAAD Portable Planner in Step 1 of the IBCS architecture to enable integration of the THAAD battery capability into the IBCS battle planning process. <p><i>FY 2017 Plans:</i></p> <ul style="list-style-type: none"> - The decrease in cost between FY 2016 and FY 2017 is primarily due to a reduction in RDT&E funding for system software support. Beginning in FY 2017, THAAD requested funding in O&M to provide deployment support for previously fielded software, reducing the RDT&E request. Funding for deployed software support was previously included in MD07: THAAD, R-2a THAAD Development, and R-3 Cost Category Item Lockheed Martin and is now found in MDA's O&M request under THAAD. Additional reductions are due to the movement of cyber security and information assurance vulnerability assessment from MD07 THAAD Development to MC07 Network/System Certification and Accreditation (C&A), the completion of intelligence data assessment updates, and lower costs associated with the testbeds being acquired in FY 2017 compared to FY 2016. <p>The following bullets describe the planned accomplishments for FY 2017:</p> <ul style="list-style-type: none"> - Continue development of Phase II debris mitigation functionality and integrate into the weapon system to improve interoperability with other BMDS elements. - Initiate development of real-time enhancements to Regional Peer-to-Peer Engagement Coordination via automated exchange coordination messages between BMD tactical level weapon systems that share defended assets and are capable of engaging a common threat. Assess enhancing Shoot-Assess-Shoot opportunities when THAAD is the second shooter. These changes will enhance THAAD's communications and interoperability with the other BMDS weapons and with the C2BMC. - Continue development of a new capability in the THAAD weapon system to launch the interceptor based on information from an external BMDS sensor prior to the threat being acquired by the battery's radar. Add the Link 16 J7.7 Association message to the THAAD Link 16 implementation. This addition facilitates launch on engagements for THAAD and other BMD Weapon Systems, allowing them to extend their defensive coverage beyond what is possible with their organic sensors. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Continue the acquisition of testbeds required to support multiple fielded battery configurations, development and integration of component software into system level software builds, and flight test pre-post- test analysis. Without this acquisition the current, limited testbeds must continue to be shared, thus impacting support to deployed batteries, development deliveries, and flight tests. - Complete development of packaged threat products to enable deployed and fielded batteries to upload new data on threat missiles as they evolve without updating the entire tactical software package. This will allow the THAAD weapon system to be updated on threats missiles more frequently. - Complete initial update of performance characteristics of threat missiles to be included in the packaged threat products update. Updated threat characteristics are based on intelligence data and will optimize THAAD weapon system performance against enhanced threats. - Continue development to mitigate the effects of Track ID Proliferation through the implementation of BMDS changes approved in MIL- STD-6016 Interface Change Proposals (ICPs) in coordination with Aegis BMD, C2BMC and MDA Engineering. - Continue the development and coordination of the THAAD Portable Planner into Step 1 of the IBCS architecture to enable integration of the THAAD battery capability into the IBCS battle planning process. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - The increase in cost between FY 2017 and FY 2018 is primarily due to the initiation of software development efforts to allow THAAD to engage a target tracked by a different BMDS sensor via C2BMC, as well as newly defined requirements Electronic Protection / Objective Debris Mitigation previously included in THAAD Follow-on to provide an improved capability to engage SRBM, MRBM and limited IRBM threats capable of creating complex scenes. - Complete development of Phase II debris mitigation functionality and integration into the weapon system to improve interoperability with other BMDS elements - Continue development for THAAD Electronic Protection/Objective Debris Mitigation and implementation of flexible-threat packages and defense planning in order to provide an improved capability to engage SRBM, MRBM and limited IRBM threats capable of creating complex scenes. - Continue analysis of potential enhancements to Regional Peer-to-Peer Engagement Coordination between BMD tactical level weapon systems that share defended assets and are capable of engaging a common threat to conserve missile inventory and maximize engagements. - Continue development of expanded defended area footprints via remote operation of THAAD Launchers. This effort adds additional communication pathways between launchers and TFCC to allow launchers to be emplaced and operated beyond the limit of current fiber optic cables carried by the battery. - Continue acquisition and upgrades to test beds to support software development, cyber security efforts, and changes to hardware configuration. - Continue the incremental transition of software support from the Prime Contractor to organic support in order to reduce total system life cycle costs. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Continue mitigation of Track ID Proliferation to improve situational awareness when the warfighter is presented target information from multiple BMDS sensors. - Complete the development and coordination of the THAAD Portable Planner into Step 1 of the IBCS architecture to enable integration of the THAAD battery capability into the IBCS battle planning process in order to expand interoperability with air and missile defense systems. - Initiate Block Development Process to identify THAAD evolution and synchronize requirements that address threat evolution, obsolescence needs, Army training needs, reliability and sustainment issues. Perform redesign mitigation for obsolescence which could impact THAAD's future capability evolution. - Conduct studies to assist in identification of concepts and solutions to interceptors, sensors, and command and control to close potential THAAD capability gaps in order to provide enhanced defense against emerging regional threats. - Continue development of improved tactical network architecture in order to increase availability, robustness, and security of the system to counter cybersecurity threats. - Initiate developmental efforts to replace current GPS antennas with anti-jam and regional clock capabilities. This effort is a Department of Defense mandate to ensure the integrity and availability of positioning, navigation, and timing data for the THAAD weapon system. 			
<p>Title: Program Operations</p> <p align="right">Articles:</p> <p>Description: Program Operations provides strategic planning, program integration, contracting, acquisition, engineering, financial management, internal reviews and audits, and program assessments for the THAAD Program Office.</p> <p>Recurring activities include:</p> <ul style="list-style-type: none"> -Provide technical and business management support activities to provide the Program Director with critical program status and decision quality data, -Ensure THAAD program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process, -Conduct internal Baseline Execution Reviews to measure program progress against the six Missile Defense Agency approved baselines -Continue a Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs, and -Provide Quality Safety and Mission Assurance (QSMA) operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered to the Warfighter. 	45.836	44.552	45.704
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>FY 2016 Accomplishments: - See description.</p> <p>FY 2017 Plans: - See description.</p> <p>FY 2018 Plans: - See description.</p>				
<p>Title: THAAD Program Support</p> <p align="right">Articles:</p> <p>Description: This activity provides support for efforts such as communications and interoperability upgrades to operate on joint, service, or allied communications networks. This activity provides support for safety and mission assurance requirements, and support of independent government offices as part of the Materiel Release process.</p> <p>Recurring efforts include: - Interoperability development and maintenance to ensure the weapon system is authorized to operate on joint, service, or allied communications networks, and - Safety confirmation and verification testing, preparation and approvals of System Safety Risk Assessments, issuance of hazard classifications and safety releases, insensitive munitions approvals and waivers, and independent oversight and support in the areas of reliability, availability, and maintainability (RAM) and quality assurance.</p> <p>FY 2016 Accomplishments: - Set up an Institutional Conduct of Fire Trainer (ICOFT) testbed to stabilize fielded ICOFT software, resolve Software Change Requests and related findings, develop a standardized grading methodology across all ICOFT laboratories, and update ICOFT courseware impacted by the Interactive Electronic Technical Manual (IETM).</p> <p>FY 2017 Plans: - The decrease in cost between FY 2016 and FY 2017 is due the completion of ICOFT testbed upgrades in FY 2016. - See description.</p> <p>FY 2018 Plans: - See description.</p>		8.595 -	2.276 -	2.576 -
<p>Title: Project Redwood- Details at a Higher Classification</p> <p align="right">Articles:</p>		6.900 -	4.212 -	4.283 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>Description: This project is reported in accordance with Title 10, United States Code, Section 119 (a)(1) in the Special Access Program Annual Report to Congress.</p> <p>FY 2016 Accomplishments: - See description.</p> <p>FY 2017 Plans: - See description.</p> <p>FY 2018 Plans: - See description.</p>				
<p>Title: THAAD Follow-On</p> <p align="right">Articles:</p> <p>Description: MDA Engineering is assessing BMDS options, including THAAD Follow-On for solutions to counter emerging threats. Further studies are being conducted to assist in the identification of innovative concepts and solutions to existing BMDS systems (i.e., Aegis, THAAD, and PATRIOT). These studies will explore recommended options to interceptors, sensors, and command and control concepts as well as approaches that might be incorporated into a future BMDS architecture and influence future acquisition decisions, including THAAD Follow-On.</p> <p>FY 2016 Accomplishments: - In FY 2016 MDA conducted studies to identify needed improvements to the regional BMDS capabilities. As a result of the study, content related to emerging threats that present challenging, complex scenes were deemed mature enough to pursue mitigation solutions. This content was moved from THAAD Follow-on and included in the baselined THAAD II Development Program as "Electronic Protection / Objective Debris Mitigation" part of software build 4.0, and has subsequently moved to the accomplishment category THAAD Development.</p> <p>FY 2017 Plans: - The increase in cost from FY 2016 and FY 2017 is due to a \$4 million dollar investment in development of models and simulations for the THAAD Follow-On development used to predict performance and design trades. - Continue Weapon System trade studies to draft key system requirements, functional allocations, and interface definitions to address emerging threats - Continue performance analyses of system and ground component design concepts to characterize capabilities, limitations, risk and areas for improvement/correction. - Continue trade studies to assess configuration and performance requirements of interceptor components.</p>		0.000 -	17.043 -	0.000 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Continue master test plan analysis to identify range requirements and flight test instrumentation requirements, document potential flight and ground test program requirements and objectives, assess courses of action, and coordinate with stakeholders. - Initiate THAAD Follow-On Development to include advanced capabilities against emerging threats, complex scenes and countermeasures. FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	186.100	192.699	215.569

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0208866C: MD07: <i>THAAD O&M</i>	52.308	72.099	78.761	-	78.761	87.478	92.082	91.832	93.716	Continuing	Continuing
• 0208866C: MD07: <i>THAAD Procurement</i>	447.971	369.608	451.592	-	451.592	440.883	405.015	420.829	429.463	978.463	3,943.824
• 0604876C: <i>Ballistic</i> <i>Missile Defense Terminal</i> <i>Defense Segment Test</i>	20.980	63.444	36.239	-	36.239	68.865	15.667	49.706	51.451	Continuing	Continuing

Remarks

D. Acquisition Strategy
 The THAAD program awards Indefinite Delivery Indefinite Quantity (IDIQ) Task Orders on the Advanced Capability Development (ACD) contract for THAAD 2.0 development. The ACD contract is comprised of over 40 separate task orders with varying contract types such as firm fixed price, fixed price incentive firm, cost plus incentive fee, and cost plus fixed fee. The discrete task orders allow management and tracking of Development work.

E. Performance Metrics
 N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Terminal High Altitude Area Defense (THAAD) Development - Advanced Capability Development	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	568.646	69.315	Nov 2015	82.368	Oct 2016	125.621	Nov 2017	-		125.621	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - IT Program Support	C/CPAF	Northrup Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	2.306	Nov 2015	1.889	Oct 2016	2.952	Nov 2017	-		2.952	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Lockheed Martin	SS/CPFF	LMSSC : Sunnyvale, CA/Huntsville, AL	0.000	0.000		12.995	Oct 2016	0.000		-		0.000	0	12.995	0
Terminal High Altitude Area Defense (THAAD) Development - MDA Program Support	MIPR	Missile Defense Agency (MDA) : Ft. Belvoir, VA/ Huntsville, AL	94.841	6.002	Oct 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Models & Simulations	MIPR	US Army Research, Development, Engineering Command (RDECOM) : Huntsville, AL	147.529	25.626	Dec 2015	25.000	Oct 2016	23.527	Dec 2017	-		23.527	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Radar Engineering	SS/CPAF	Raytheon : Massachusetts	0.000	9.862	Jun 2016	0.000		0.000		-		0.000	0	9.862	0
Terminal High Altitude Area Defense (THAAD) Development - Requirements and Design	C/CPAF	Boeing : AL	5.879	4.540	Nov 2015	1.153	Dec 2016	2.817	Dec 2017	-		2.817	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Software Support (GOVT)	MIPR	US Army Research, Development, Engineering Command	0.000	2.097		0.000		6.313	Nov 2017	-		6.313	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		(RDECOM) : Huntsville, AL													
Terminal High Altitude Area Defense (THAAD) Development - Verification and Assessment	C/CPFF	Parsons : AL / CO	5.000	5.021	Nov 2015	1.211	Dec 2016	1.776	Dec 2017	-		1.776	Continuing	Continuing	Continuing
THAAD Follow-On - THAAD Follow-On Risk Reduction	SS/CPIF	Lockheed Martin : CA, TX, AL	0.000	0.000		17.043	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			821.895	124.769		141.659		163.006		-		163.006	-	-	-

Remarks

- Award dates are shown as October as they are the continuation of task orders or MIPRs from previous FYs.
- Decrease in FY 2017 R-3 Cost Category Item "Lockheed Martin" is due to the movement of funding for the support of software previously fielded to O&M funding and the movement of cyber security and information assurance vulnerability assessment into budget project MC07.
- Increase in FY 2018 R-3 Cost Category Item "Advanced Capability Development" is primarily due to combining efforts previously shown separately as R-3 Cost Category Item "Lockheed Martin" to represent total planned funding for the ACD contract, as well as increases in development efforts for THAAD Software Build 4.0. The ACD contract is comprised of over 40 separate task orders with varying contract types such as firm fixed price, fixed price incentive firm, cost plus incentive fee, and cost plus fixed fee. - The addition of R-3 Cost Category Item "Software Support (GOVT)" in FY 2018 is the incremental transition of software support from the Prime Contractor to AMRDEC to reduce total system life cycle costs - Increase in FY 2017 R-3 Cost Category Item "Advanced Capability Development" is primarily related to initiation of software developments efforts in FY 2017, such as Regional Peer to Peer Engagement Coordination. Additional increase is due to the acquisition of testbeds to support multiple THAAD battery configurations.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Operations - Program Operations	Various	Missile Defense Agency (MDA) : Ft. Belvoir, VA/ Huntsville, AL	143.687	45.836	Oct 2015	44.552	Oct 2016	45.704	Oct 2017	-		45.704	Continuing	Continuing	Continuing
THAAD Program Support - Mission Support	MIPR	ATEC / SMDC / AMRDEC / MDA :	10.625	7.995	Nov 2015	2.276	Oct 2016	2.576	Nov 2017	-		2.576	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		WSMR, NM / Huntsville, AL													
THAAD Program Support - Prime Contractor Support	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	0.000	0.600		0.000		0.000		-		0.000	0	0.600	0
THAAD Program Support - Prior year no longer funded in the FYDP	Various	Various : Various	25.874	0.000		0.000		0.000		-		0.000	0	25.874	0
Project Redwood- Details at a Higher Classification - Special Programs	SS/FP	N/A : N/A	66.187	6.900	Oct 2015	4.212	Oct 2016	4.283	Oct 2017	-		4.283	Continuing	Continuing	Continuing
Subtotal			246.373	61.331		51.040		52.563		-		52.563	-	-	-

Remarks
- Award dates are shown as October as they are the continuation of task orders or MIPRs from previous FYs.

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency							Date: May 2017				
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>				Project (Number/Name) MD07 / <i>THAAD</i>				

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,068.268	186.100	192.699	215.569	-	215.569	-	-	-

Remarks
 Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

	Significant Event Complete ▲			Milestone Decision Complete ★			Element Test Complete ◆			System Level Test Complete ●			Complete Activity ◆								
	Significant Event Planned △			Milestone Decision Planned ☆			Element Test Planned ◇			System Level Test Planned ○			Planned Activity ◇								
	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022		
THAAD Follow-On Risk Reduction Studies	◆	◆	◆																		
Launch on Link 16 Preliminary Design Review					△																
Regional Peer to Peer Engagement Preliminary Design Review					△																
THAAD Software Build 4.0 Engineering Requirements Review (ERR)						△															
THAAD Software Build 4.0 Preliminary Design Review (PDR)								△													
THAAD Software Build 4.0 Engineering Design Review (EDR)									△												
THAAD Software Build 3.0 Delivery									△												
THAAD Software Build 5.0 Engineering Requirements Review (ERR)											△										
THAAD Software Build 5.0 Preliminary Design Review (PDR)												△									
THAAD Software Build 5.0 Engineering Design Review (EDR)														△							
THAAD Software Build 4.0 Delivery															△						
THAAD Software Build 5.0 Delivery																		△			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
THAAD Follow-On Risk Reduction Studies	1	2016	3	2016
Launch on Link 16 Preliminary Design Review	2	2017	2	2017
Regional Peer to Peer Engagement Preliminary Design Review	2	2017	2	2017
THAAD Software Build 4.0 Engineering Requirements Review (ERR)	3	2017	3	2017
THAAD Software Build 4.0 Preliminary Design Review (PDR)	1	2018	1	2018
THAAD Software Build 4.0 Engineering Design Review (EDR)	3	2018	3	2018
THAAD Software Build 3.0 Delivery	3	2018	3	2018
THAAD Software Build 5.0 Engineering Requirements Review (ERR)	4	2018	4	2018
THAAD Software Build 5.0 Preliminary Design Review (PDR)	2	2019	2	2019
THAAD Software Build 5.0 Engineering Design Review (EDR)	4	2019	4	2019
THAAD Software Build 4.0 Delivery	2	2020	2	2020
THAAD Software Build 5.0 Delivery	2	2021	2	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC07: <i>Cyber Operations</i>	1.188	0.572	5.605	3.325	-	3.325	7.563	10.595	10.686	8.698	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Cyber Operations sustain MDA Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities; analysis of validation results, risk assessments; reviews of proposed Program Manager/Information Assurance Manager Plans of Action and Milestones for MDA THAAD mission systems; and supports THAAD certification to operate in the BMDS.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network / System Certification and Accreditation (C&A)	0.572	5.605	3.325
Articles:	-	-	-
Description: Funding in this project sustains MDA RMF and CVT activities, analysis of validation results, risk assessments, monitoring and tracking of Cybersecurity mitigations, and all other activities necessary to comply with the Federal Information Security Management Act (FISMA).			
Recurring efforts include:			
- Conducting cyber security / information assurance engineering and architecture planning for THAAD information technology systems			
- Developing and testing cyber security/information assurance control measures for BMDS THAAD systems			
- Developing THAAD RMF for DoD IT certification and accreditation packages			
- Supporting CVT of THAAD mission, test, and training systems			
- Developing Plan of Action and Milestones (POA&Ms) to resource and remediate information assurance deficiencies			
- Conducting annual information assurance reviews on the THAAD enclaves to assess compliance in implementing and maintaining IA controls			
FY 2016 Accomplishments:			
- Initiated transition of THAAD systems to RMF for DoD IT in accordance with new DoD cybersecurity direction.			
- See description for other activities			
FY 2017 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - The increase in cost between FY 2016 and FY 2017 is primarily due to movement of \$2.7 million of cyber security and information assurance vulnerability assessment from MD07: THAAD, R-2a THAAD Development to MC07: Cyber Operations, Network/System Certification and Accreditation (C&A) to better depict cyber security funding. The FY 2017 Request for Additional Appropriation added \$2.2 million required to strengthen Cybersecurity posture to ensure emergency warfighting readiness BMDS requirements, and is captured in the Windows 10 Implementation Cost Category. - Perform IAVA to mitigate potential system vulnerabilities and to ensure continued performance and operation of fielded batteries - Update THAAD software and hardware to ensure compliance with DoD Weapon System Information Assurance Programs and guidance - Complete transition of THAAD systems to RMF for DoD IT IAW new DoD cybersecurity direction - Initiate implementation of Microsoft Windows 10 Operating Systems' migration for mission support systems in order to comply with Secretary of Defense's mandated transition timeline to strengthen Cybersecurity posture. - See description for other activities <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Decrease from FY 2017 to FY 2018 is due to completion of Windows 10 implementation activities - Continue performing IAVA to mitigate potential system vulnerabilities - Continue updating THAAD software and hardware to ensure compliance with DoD Weapon System Information Assurance Programs - See description for other activities 			
Accomplishments/Planned Programs Subtotals	0.572	5.605	3.325

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0208866C: MD07: THAAD O&M	52.308	72.099	78.761	-	78.761	87.478	92.082	91.832	93.716	0	568.276
• 0208866C: MD07: THAAD Procurement	447.971	369.608	451.592	-	451.592	440.883	405.015	420.829	429.463	978.463	3,943.824
• 0604876C: Ballistic Missile Defense Terminal Defense Segment Test	20.980	63.444	36.239	-	36.239	68.865	15.667	49.706	51.451	Continuing	Continuing

Remarks

D. Acquisition Strategy
N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services	C/CPFF	Torch Technologies : Various MDA Locations	1.188	0.572	Oct 2015	0.664	Oct 2016	0.678	Oct 2017	-		0.678	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Security Engineering	SS/CPFF	LMSSC : Sunnyvale, CA/Huntsville, AL	0.000	0.000		2.703	Oct 2016	2.647	Jan 2018	-		2.647	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Windows 10 Implementation - OGA Labs	MIPR	AMRDEC : Huntsville, AL	0.000	0.000		0.627	May 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Windows 10 Implementation - Prime Contractor	SS/CPFF	LMSSC : Various	0.000	0.000		1.611	May 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			1.188	0.572		5.605		3.325		-		3.325	-	-	-

Remarks
The increase in cost between FY 2016 and FY 2017 in the R3 category Security Engineering is due to movement of cyber security and information assurance vulnerability assessment into budget project MC07 from the budget project MD07, R3 category Lockheed Martin beginning in FY 2017. Award dates are shown as October as they are the continuation of task orders or MIPRs from previous FYs. The FY 2017 Request for Additional Appropriation added \$2.238 million required to strengthen Cybersecurity posture to ensure emergency warfighting readiness BMDS requirements, and is captured in the Windows 10 Implementation Cost Category Items above.

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.188	0.572	5.605	3.325	-	3.325	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>
--	---	--

	Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆									
	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇									
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
MC07 Completed Cyber Operations	◆	◆	◆	◆										
MC07 Planned Cyber Operations					◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC07 Completed Cyber Operations	1	2016	1	2017
MC07 Planned Cyber Operations	2	2017	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD06: <i>Patriot Advanced Capability-3 (PAC-3)</i>	6.486	1.066	1.130	1.162	-	1.162	1.171	1.245	1.264	1.290	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

A. Mission Description and Budget Item Justification

PAC-3 is an operational, land-based weapon built upon the proven U.S. Army Phased Array Tracking Radar Intercept on Target (PATRIOT) air and missile defense infrastructure. The Army is responsible for production and further development of the PAC-3 System; MDA remains responsible for any BMDS interoperability and integration efforts. Lower Tier Project Office (LTPO) will utilize MDA funds to further the integration of PATRIOT with the BMDS.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: General Support	1.066	1.130	1.162
Articles:	-	-	-
Description: MDA funds PATRIOT participation in BMDS interoperability integration efforts. Activities support the day-to-day tasking that is leveraged upon LTPO by MDA based on the Transfer and Transition Plan Annex L.			
FY 2016 Accomplishments: See description.			
FY 2017 Plans: See description.			
FY 2018 Plans: See description.			
Accomplishments/Planned Programs Subtotals	1.066	1.130	1.162

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 0208866C: MD07: <i>THAAD O&M</i>	52.308	72.099	78.761	-	78.761	87.478	92.082	91.832	93.716	0	568.276

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>
--	---	---

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0208866C: MD07: <i>THAAD Procurement</i>	447.971	369.608	451.592	-	451.592	440.883	405.015	420.829	429.463	978.463	3,943.824
• 0604876C: <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	20.980	63.444	36.239	-	36.239	68.865	15.667	49.706	51.451	Continuing	Continuing

Remarks

D. Acquisition Strategy

The planned acquisition strategy for PATRIOT (Phased Array Tracking Radar Intercept on Target) support awards Task Orders on multiple contract vehicles and memorandum of Agreements with other government agencies. The program is considering opportunities for potential competitive awards.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
General Support - General Support	C/FFP	Intuitive Research and Technology / Wyle CAS / SAIC : Huntsville, AL	6.486	1.066	Nov 2015	1.130	Nov 2016	1.162	Nov 2017	-	-	1.162	Continuing	Continuing	Continuing
Subtotal			6.486	1.066	-	1.130	-	1.162	-	-	1.162	-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>
--	---	---

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.486	1.066		1.130		1.162		-		1.162	-	-	-

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>
--	---	---

	Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆									
	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇									
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
MD06 Completed Patriot Advanced Capability-3 (PAC-3)	◆	◆	◆	◆										
MD06 Planned Patriot Advanced Capability-3 (PAC-3)							◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD06 Completed Patriot Advanced Capability-3 (PAC-3)	1	2016	1	2017
MD06 Planned Patriot Advanced Capability-3 (PAC-3)	2	2018	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	65.682	9.879	9.638	10.106	-	10.106	9.292	11.668	12.635	12.662	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016 and FY 2017, Program Wide Support reflects proportional changes as a result of decreases in Ballistic Missile Defense Terminal Defense Segment. FY 2018 reflects proportional changes as a result of increases in Ballistic Missile Defense Terminal Defense Segment. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts and Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA-wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	9.879	9.638	10.106
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	9.879	9.638	10.106

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance (MIPR)	MIPR	Various : VA	3.500	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	5.167	1.440		0.195	Jul 2017	0.202	Jul 2018	-		0.202	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations User Services	C/CPAF	Various : Multi: AL, CA, CO, VA	2.795	0.000		0.720	Jul 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	Various : MDA Multi: AL, CO, CA, VA,	14.049	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support International and Materiel and Readiness	MIPR	Various : Multi: AL, VA, Aust, Japan	1.645	0.284	Oct 2015	0.605	Jul 2017	0.921	Jul 2018	-		0.921	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	37.756	8.001	Jan 2016	7.619	Jan 2017	8.983	Jan 2018	-		8.983	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	C/CPAF	Various : Multi: AL, VA	0.770	0.154	Aug 2016	0.499	Aug 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			65.682	9.879		9.638		10.106		-		10.106	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	65.682	9.879	9.638	10.106	-	10.106	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017													
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>						Project (Number/Name) MD40 / <i>Program-Wide Support</i>							
Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇	
						FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
MD40 Program-Wide Support						◇◇◇◇		◇◇◇◇		◇◇◇◇		◇◇◇◇		◇◇◇◇		◇◇◇◇		◇◇◇◇	

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	2,381.252	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
MD08: <i>Ground Based Midcourse</i>	2,191.513	1,193.273	815.796	777.692	-	777.692	579.986	598.610	518.755	509.040	Continuing	Continuing
MC08: <i>Cyber Operations</i>	6.848	14.686	4.563	18.818	-	18.818	22.495	23.766	22.702	16.623	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	182.891	52.521	41.721	31.587	-	31.587	28.361	28.671	25.994	26.038	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Decrease from FY 2017 to FY 2018 reflect the completion and delivery of Ground Based Interceptors (GBIs) 48-58, completion of operational spares used for CE-I's and the flight test rotations used for FTG-11 and CTV-03; and completion and delivery of CE-II GBI upgrades.

A. Mission Description and Budget Item Justification

The Ground-based Midcourse Defense (GMD) element of the Ballistic Missile Defense System (BMDS) provides combatant commanders with a continuously available (24 hours a day, 365 days a year) capability to defend the Homeland against limited Intercontinental Ballistic Missile (ICBM) attacks. The GMD capability consists of Ground Based Interceptors (GBI), GMD Fire Control system (GFC), GMD Communications Network (GCN), In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT) and ground Launch Support Systems (LSS). By the end of 2017, the Missile Defense Agency (MDA) will have 44 operationally deployed GBIs located at Fort Greely, Alaska (40 GBIs) and Vandenberg Air Force Base, California (4 GBIs). Each GBI delivers a single Exoatmospheric Kill Vehicle (EKV) to defeat threat warheads in space during the midcourse phase of the ballistic trajectory. The GFC consists of fire control nodes in Fort Greely, Alaska and Missile Defense Integration and Operations Center (MDIOC) Colorado Springs, Colorado. IDTs are currently located in Fort Greely, Alaska; Vandenberg Air Force Base, California; Eareckson Air Station, Alaska; and Fort Drum, New York. The GMD capability leverages integration of BMDS sensors in Alaska, California, United Kingdom, Japan, and Greenland. Development objectives for GMD include: improve homeland defensive capability against an evolving threat that is increasing both in number of missiles and complexity of threat payloads, support Salvo Flight Test-11, modernize the GMD ground system, provide fire control and communications, develop GBI software enhancements that improve reliability and discrimination, improve GMD models and simulations, and participate with other BMDS assets in system ground tests.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	1,269.913	862.080	701.311	-	701.311
Current President's Budget	1,260.480	862.080	828.097	-	828.097
Total Adjustments	-9.433	0.000	126.786	-	126.786
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	9.999	0.000			
• SBIR/STTR Transfer	-19.432	0.000			
• Other Adjustment	0.000	0.000	126.786	-	126.786

Change Summary Explanation

The increase from PB17 to PB18 in FY 2018 begins work to ensure no fewer than 44 GBIs are deployed through the FYDP.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>				Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD08: <i>Ground Based Midcourse</i>	2,191.513	1,193.273	815.796	777.692	-	777.692	579.986	598.610	518.755	509.040	Continuing	Continuing
Quantity of RDT&E Articles	11	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2017 to FY 2018 is due to the completion and delivery of Ground Based Interceptors (GBIs) 48-58, completion of operational spares used for CE-I's and the flight test rotations used for FTG-11 and CTV-03; and completion and delivery of CE-II GBI upgrades.

A. Mission Description and Budget Item Justification

Ground-based Midcourse Defense (GMD) includes development and delivery of GMD Ground Systems, Ground Based Interceptors, Systems Engineering and Program Management. Development objectives for GMD include: improve homeland defensive capability against an evolving threat that is increasing both in number of missiles and complexity of threat payloads, support Salvo Flight Test-11, modernize the GMD ground system, provide fire control and communications, develop GBI software enhancements that improve reliability and discrimination, improve GMD models and simulations, and participate with other BMDS assets in system ground tests. GMD will continue the effort to develop and field improved standalone and integrated BMDS discrimination capabilities, both of which will improve the BMD System's ability to identify lethal reentry vehicles and non-lethal threat objects for enhanced intercept performance.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Ground Based Interceptor Development	98.217	53.130	71.389
Articles:	-	-	-
Description: The Ground Based Interceptor (GBI) Program will continue to develop improvements to enhance reliability, counter emerging threats, eliminate obsolescence and incorporate available technologies. The increase in FY 2018 begins work to ensure no fewer than 44 GBIs are deployed through the FYDP			
FY 2016 Accomplishments:			
-Reduced Configuration 3 (C3) integrated boost vehicle development risks by conducting market research, initiating a survivability working group, identifying potential areas of improvement, conducting direct lightning strike and thermal testing of sample Small Business Innovation Research initiative lightning protection concepts. The C3 incorporates enhanced lightning protection, power transient protection, survivability enhancements, two-way communication enhancements, and kill assessment enhancements			
-Completed 11 of 15 new/modified component qualifications for the Configuration 2 (C2) integrated boost vehicle with Consolidated Booster Avionics Upgrade (CBAU) and five of six new/modified component qualifications of the CE-II Block I Exoatmospheric Kill Vehicle (EKV) for the FTG-15 flight test interceptor and ten Ground Based Interceptors (GBIs 49-58)			
-Successfully demonstrated the Capability Enhancement II (CE-II) Exo-atmospheric Kill Vehicle (EKV) with Divert and Attitude Control System (DACs) Alternate Divert Thruster (ADT) and new EKV discrimination algorithms during Controlled Vehicle Test 02			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>(CVT-02)</p> <ul style="list-style-type: none"> -Initiated upgrade and non-tactical equipment integration of two previously fielded GBIs to support the first GBI salvo test, FTG-11 -Improved ability to repair fielded GBIs and upgrade previously fielded GBIs for flight testing by acquiring EKV, Booster Avionics Module (BAM), and Booster Stack limited life item replacement units and spares -Developed new versions of EKV software (implements Near-Term discrimination improvements) and the initial C2 booster software to reduce risk to the CE-II Block 1/C2 interceptor flight test (FTG-15) and future fielding -Initiated acquisition for booster software to support a system-selectable 2- or 3-stage mode for integration into the operational fleet; providing the warfighter increased flexibility <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> -Complete development of Configuration 2 (C2) integrated boost vehicle with Consolidated Booster Avionics Upgrade (CBAU) and CE-II Block I Exoatmospheric Kill Vehicles (EKV) Ground Based Interceptors (GBIs 48-58) to support both operations and testing, including a flight test to demonstrate the capability of the CE-II Block 1 with C2 CBAU booster GBIs -Continue flight test rotation program of fielded GBIs by upgrading kill vehicles and boosters, adding the necessary non-tactical equipment to support the Integrated Master Test Plan (IMTP) requirements -Complete delivery of EKV, Booster Avionics Module (BAM), and Booster Stack limited life item replacement units, operational spares, repair parts and materials required for interceptor repair and Flight Test Rotation upgrade activities -Continue EKV software development in accordance with the Software Development Plan (SDP) to implement enhancements and defect corrections for multiple versions of EKV software for fielded and Flight Test Rotation interceptors -Field Near-term discrimination improvements capability and test Mid-term capability -Complete delivery of the Divert Attitude Control System Alternate Propellant Tank to support fielding 44 GBIs by the end of CY 2017 and to provide improved reliability, manufacturability, and consistency in performance over the expected life span of a GBI <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> -Test and field interceptor software upgrade with improved mid-term discrimination capability and capabilities to improve EKV performance reliability for known issues in order to enhance system capability against robust threat systems -Deliver two flight test configured interceptors to support the first GBI salvo test (FTG-11) -Begin work to ensure no fewer than 44 GBIs are deployed through the FYDP 				
<p>Title: Ground Based Interceptor Manufacturing</p> <p align="right">Articles:</p> <p>Description: The Ground Based Interceptor (GBI) Program will continue to manufacture GBIs to support the DoD mandate of 44 fielded GBIs by 2017.</p> <p>FY 2016 Accomplishments:</p>		476.199	241.637	125.272
		-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>-Produced, integrated, and emplaced the first flight test interceptor utilizing a Capability Enhancement II (CE-II) Exo-atmospheric Kill Vehicle (EKV) with Divert and Attitude Control System (DACS) Alternate Divert Thrusters (ADT) and new EKV discrimination algorithms flown during Controlled Test Vehicle (CTV-02), reducing risk to the FTG-15 flight test and capability fielding</p> <p>-Completed integration and test of the first of 11 new CE-II Block I Exo-atmospheric Kill Vehicles (CE-II Blk 1) to support program flight testing (FTG-15)</p> <p>-Initiated integration and test of the first of 11 new Configuration 2 (C2) integrated boost vehicles with Consolidated Booster Avionics Upgrade (CBAU) to support program flight testing (FTG-15)</p> <p>-Completed contract action to convert a planned 2-Stage CE-II Block 1/C2 flight test interceptor to a 3-Stage tactical interceptor to enable delivery of a 9th tactical CE-II Blk 1/C2 GBI in FY 2018</p> <p>-Initiated production of 11 CE-II Block I Exo-atmospheric Kill Vehicles (CE-II Blk 1) and 11 Configuration 2 (C2) integrated boost vehicles to support the DoD mandate of 44 fielded GBIs by CY 2017</p> <p>FY 2017 Plans:</p> <p>-Continue acquisition of Configuration 2 (C2) integrated boost vehicle with the Consolidated Booster Avionics Upgrade (CBAU) and CE-II Block I Exoatmospheric Kill Vehicles (EKV) Ground Based Interceptors (GBIs 48-58) to support both operations and testing, including a flight test (FTG-15) to demonstrate the capability of the CE-II Block 1 with C2 CBAU booster GBIs</p> <p>FY 2018 Plans:</p> <p>-Decrease from FY 2017 to FY 2018 reflects completion and delivery of GBIs 48-58 CE-II Block I's</p> <p>-Deliver the final three of nine tactical CE-II Block I EKV/ C2 integrated boost vehicles with the CBAU GBI to improve warfighter capability and capacity to 44 operational GBIs</p> <p>-Begin work to ensure no fewer than 44 GBIs are deployed through the FYDP</p>			
<p>Title: Ground Based Interceptor Reliability</p> <p align="right">Articles:</p> <p>Description: The Ground Based Interceptor (GBI) reliability program conducts the analysis and testing necessary to characterize the reliability and service life of the GBI Fleet. The data generated from the reliability program allows the Program Office to manage the GBI fleet, develop design improvements, develop fleet maintenance strategies, and extend interceptor service life. The data is also used by MDA engineering to develop battle simulations for the ground test program; and by the Warfighter in developing tactics, techniques, and procedures.</p> <p>FY 2016 Accomplishments:</p> <p>-Upgraded, integrated, and re-emplaced six of eight previously fielded Capability Enhancement II (CE-II) GBIs. Upgrade will further increase fleet reliability by integrating system improvements (cradled inertial measurement unit with new firmware) proven in Flight Test Ground-based Midcourse Defense-06b (FTG-06b)</p>	92.701 -	50.826 -	22.474 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>-Conducted static fire tests of two booster motors from previously fielded GBIs to characterize lifecycle aging and performance. Test results will reduce GBI lifecycle maintenance costs and build Warfighter confidence in aging GBIs</p> <p>-Initiated dissections of an aging booster motor to verify service life and provide the Warfighter confidence in the aging fleet assets</p> <p>-Continued EKV and booster vehicle stockpile reliability program (SRP) service life testing in order to reduce GBI lifecycle maintenance cost and build Warfighter confidence in aging GBIs</p> <p>-Continued the Reliability and Systems Engineering (RSE) and the GBI Design and Reliability Characterization (D&RC) program that included:</p> <p>--GBI All-Up Round (AUR) system-level Failure Modes, Effects and Criticality Analysis. Evaluate Acceptance Test Procedure strategy and test levels for each GBI AUR configuration in-order to find and mitigate risks prior to flight test, enabling successful flight test execution and capability demonstration</p> <p>--Completed Phase 2 and began final Phase 3 of Probabilistic Risk Assessment (reliability model) development to assess the GBI design enabling improvements to overall GBI reliability for Warfighter defense of the homeland</p> <p>-Conducted component anomaly failure analysis testing to inform GBI maintenance and repair program supporting operational risk mitigation for the Warfighter</p> <p>-Conducted functional testing of naturally aged GBI subsystems and components removed from previously fielded GBIs during upgrade/modification to understand performance and aging characteristics in order to establish life limits, achieve GBI maintenance cost savings, and build Warfighter confidence in aging GBIs</p> <p>-Continued to collect Reliability, Availability, Maintainability and Test (RAM-T) data and analyze performance metrics on the Operational System in order to continuously improve the system for the Warfighter</p> <p>-Continued Ground Based Interceptor (GBI) Fleet Upgrade program in order to provide a more reliable weapon for the Warfighter</p> <p>FY 2017 Plans:</p> <p>-Complete upgrade and delivery of the fielded CE-II GBIs in the proven Flight Test Ground-based Midcourse Defense-06b (FTG-06b) configuration</p> <p>-Continue Ground Based Interceptor (GBI) Fleet Upgrade program</p> <p>-Continue to collect Reliability, Availability, Maintainability and Test (RAM-T) data and calculate and track performance metrics on the Operational System</p> <p>-Continue the Reliability and Systems Engineering (RSE) and the GBI Design and Reliability Characterization (D&RC) program that includes:</p> <p>--Configuration 2 (C2) Booster Reliability Demonstration Testing, to quantify system performance and capability</p> <p>--GBI All-Up Round (AUR) system-level Failure Modes, Effects and Criticality Analysis. Evaluate Acceptance Test Procedure strategy and test levels for each GBI AUR configuration.</p> <p>--Probabilistic Risk Assessment (reliability model) development to help prioritize future engineering efforts</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>--AUR physical design schematics & electrical grounding control plans. Conduct key engineering assessments including integrated sneak circuit analyses, Worst Case Circuit Analysis, and electrical/thermal derating analyses to document current performance/capability and identify potential risk areas</p> <p>-Continue functional testing of naturally aged GBI subsystems and components removed during upgrade/modification to understand performance and aging characteristics in order to establish life limits</p> <p>-Maintain electronic As-Built/As-Fielded GBI configuration database for real-time access to GBI configuration data across the production and maintenance organization</p> <p>-Continue rocket motor static firings and initiate motor dissections, which are both required to produce data that is needed to extend the service life of limited life items</p> <p>-Continue Probabilistic Risk Assessment for the RKV and initiate analysis for the C3 boost vehicle</p> <p>FY 2018 Plans:</p> <p>-Decrease from FY 2017 to FY 2018 due to completion and delivery of CE-II GBI upgrades.</p> <p>-Conduct key RKV engineering assessments including integrated sneak circuit analyses, Worst Case Circuit Analysis, and electrical/thermal derating analyses to document current performance/capability and identify potential risk areas to assess and improve overall RKV reliability for the Warfighter</p> <p>-Continue to collect RAM-T data and analyze performance metrics on the Operational System in order to continuously improve the system for the Warfighter</p> <p>-Continue Probabilistic Risk Assessment (reliability model) development to assess the GBI design enabling improvements to overall GBI reliability for Warfighter defense of the homeland</p> <p>-Continue SRP functional testing of naturally aged GBI subsystems and components removed from previously fielded GBIs during upgrade/modification to understand performance and aging characteristics in order to establish life limits, achieve GBI maintenance cost savings, and build Warfighter confidence in aging GBIs</p> <p>-Maintain electronic As-Built/As-Fielded GBI configuration database for real-time access to GBI configuration data across the production and maintenance organization in order to quickly identify risks associated with each GBI and implement fleet mitigation actions as required</p> <p>-Continue rocket motor propellant studies to extend the service life of limited life items in order to achieve cost savings on GBI lifecycle maintenance and further build Warfighter confidence in aging GBIs</p> <p>-Initiate Probabilistic Risk Assessment for the C3 boost vehicle to assess the design enabling improvements to overall GBI reliability for Warfighter defense of the homeland</p> <p>-Initiate RKV Stockpile Reliability Program in order to achieve GBI lifecycle sustainment cost savings</p>				
Title: Systems Engineering and Program Management		276.117	267.195	271.609
Articles:		-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Description: GMD Systems Engineering and Program Management provide essential services for the development and fielding of the GMD hardware and software and Industry Program Management operations. Included in this effort are concept definition, requirements and interfaces, system design, integration, test planning and verification efforts. Key products are development and maintenance of the technical baseline and critical engineering processes for implementation and delivery of an integrated GMD element capability.</p> <p>Program Management provides for prime contractor management of the GMD program. This effort includes program and business management, program administration, technical and testing oversight, verification of hardware and software development, quality/safety/mission assurance, integrated logistics support, and infrastructure to develop, test and sustain the GMD system and components.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Continued requirements development, engineering analysis, capability integration, and performance verification for GMD development and BMDS integration for the evolving threat -Continued sustainment of core information technology data and unified communications services to accomplish research and development activities. -Continued Technical Direction Agent activities to provide the technical expertise and program execution experience required to offer independent assessment/analysis, unbiased and objective defensive weapon system level-oriented advice on technical issues and product development, and recommendations on technical issues and product development challenges facing in the GMD Program -Continued modeling and simulation development and integration to assess component and system performance in support of annual technical assessments -Continued the development of modeling and simulation wrapped tactical code to reduce the life cycle cost and increase the fidelity of the results and integrate GMDSim into the new Objective Simulation Framework (OSF) -Continued modeling and simulation verification, validation, and accreditation (VV&A) to establish high confidence for Warfighter assessments -Continued design, planning, and pre- and post-flight test analysis for current and future flight and ground tests to assess system performance and implement a rigorous test plan for verifying successful operation of capabilities delivered to the Warfighter -Utilized Exoatmospheric Kill Vehicle (EKV) Hardware in the loop (HWIL) 10-foot vacuum space chamber (10V Chamber) for operational analysis of emerging threats, discrimination improvements performance and Pre-Mission Testing and Post Flight analysis and reconstruction in accordance with the Integrated Master Test Plan (IMTP) to reduce execution risks from additional data and gaining confidence that capabilities performed as expected -Provided contractor program management, subcontract management, quality assurance, verification of hardware and software 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>development, and technical and testing oversight to ensure the program meets all cost, schedule, and performance requirements</p> <ul style="list-style-type: none"> -Fielded Near-term discrimination improvements capability -Completed Near-term discrimination improvements ground testing via ground test distributed (GTD-06) -Initiated top-down and bottoms-up requirements audit to include: functional decomposition / traceability, bottoms-up verification sufficiency audit, and establish detailed performance requirement error budgets and allocations to ensure complete understanding of system capability and potential gaps -Initiated a rigorous independent verification and validation (IV&V) and system engineering analysis of GMD software to increase Warfighter confidence in the tactical system performance and reliability <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> -Continue requirements development, engineering analysis, capability integration, and performance verification for GMD development and BMDS integration -Continue effort to assess the current GMD capabilities against the evolving threat -Continue sustainment of core information technology data and unified communications services to accomplish research and development activities. -Continue Technical Direction Agent activities to provide the technical expertise and program execution experience required to offer independent assessment/analysis, unbiased and objective defensive weapon system level-oriented advice on technical issues and product development, and providing recommendations on technical issues and product development challenges facing in the GMD Program -Continue modeling and simulation development and integration to assess component and system performance in support of annual technical assessments -Continue the development of modeling and simulation wrapped tactical code to reduce the life cycle cost and increase the fidelity of the results and integrate GMDSim into the new Objective Simulation Framework (OSF) -Continue modeling and simulation verification, validation, and accreditation (VV&A) to establish high confidence in Warfighter assessments -Continue design, planning, and pre- and post-flight test analysis for current and future flight and ground tests to assess system performance and implement a rigorous test plan for verifying successful operation of capabilities delivered to the Warfighter -Utilize Exoatmospheric Kill Vehicle (EKV) Hardware in the loop (HWIL) 10-foot vacuum space chamber (10V Chamber) for operational analysis of emerging threats, discrimination improvements performance and pre-mission testing and post flight analysis and reconstruction in accordance with the Integrated Master Test Plan (IMTP) to reduce execution risks and gain confidence that capabilities performed as expected -Provide contractor program management, subcontract management, quality assurance, verification of hardware and software design, and technical and testing oversight to ensure the program meets all cost, schedule, and performance requirements 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>-Continue top-down and bottoms-up requirements audit to include: functional decomposition / traceability, bottoms-up verification sufficiency audit, and establishment of detailed performance requirement error budgets and allocations to ensure complete understanding of system capability and potential gaps</p> <p>-Continue a rigorous independent verification and validation (IV&V) and system engineering analysis of GMD software to increase Warfighter confidence in the tactical system performance and reliability</p> <p>-Complete design and development of Mid-term discrimination improvements techniques</p> <p>-Continue test planning for discrimination improvements capabilities</p> <p>-Develop definition of fire control/weapon handover improvements and initiate preliminary design</p> <p>-Continue Cybersecurity Operations Upgrade Program consisting of efforts to enhance the cybersecurity posture of the GMD operational information systems and its supporting information systems and components</p> <p>-Implement vulnerability mitigation activities for the Power Control and Monitoring System (PCMS) and Site Control and Monitoring System (SCMS) that are required to maintain their Authority to Operate (ATO)</p> <p>-Train and certify contractor Information Assurance Workforce personnel involved in developing GMD test, training, and mission support information systems</p> <p>FY 2018 Plans:</p> <p>-Complete the Enhanced Homeland Defense Systems Engineering activities under the current prime contract while simultaneously commencing a new Robust Homeland Defense Systems Engineering Prime Contract</p> <p>-Continue requirements development, engineering analysis, capability integration, and performance verification for GMD development and BMDS integration</p> <p>-Continue effort to assess the current GMD capabilities against the evolving threat</p> <p>-Continue sustainment of core information technology data and unified communications services to accomplish research and development activities.</p> <p>-Continue Technical Direction Agent activities to provide the technical expertise and program execution experience required to offer independent assessment/analysis, unbiased and objective defensive weapon system level-oriented advice on technical issues and product development challenges facing the GMD Program</p> <p>-Continue modeling and simulation development and integration to assess component and system performance in support of annual technical assessments</p> <p>-Continue the development of modeling and simulation wrapped tactical code to reduce the life cycle cost and increase the fidelity of the results and integrate GMD Sim into the new OSF</p> <p>-Continue modeling and simulation VV&A to establish high confidence in Warfighter assessments</p> <p>-Continue design, planning, and pre- and post-flight test analysis for current and future flight and ground tests to assess system performance and implement a rigorous test plan for verifying successful operation of capabilities delivered to the Warfighter</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-Continue to utilize the EKV HWIL 10V Chamber for operational analysis of emerging threats, discrimination improvements performance, pre-mission testing and post flight analysis and reconstruction in accordance with the Integrated Master Test Plan (IMTP) to reduce execution risks and gain confidence that capabilities performed as expected</p> <p>-Continue to provide contractor program management, subcontract management, quality assurance, verification of hardware and software design, and technical and testing oversight to ensure the program meets all cost, schedule, and performance requirements</p> <p>-Continue top-down and bottoms-up requirements audit to include: functional decomposition / traceability, bottoms-up verification, sufficiency audit, and establishment of detailed performance requirement error budgets and allocations to ensure complete understanding of system capability and potential gaps</p> <p>-Continue a rigorous IV&V and system engineering analysis of GMD software to increase Warfighter confidence in the tactical system performance and reliability</p> <p>-Complete design and development of Mid-term discrimination improvements techniques</p> <p>-Continue test planning for discrimination improvements capabilities</p> <p>-Continue development of discrimination improvements through Far Term</p> <p>-Continue to develop the definition of fire control/weapon handover improvements and create preliminary design</p>				
<p>Title: Program Operations</p> <p>Description: Program Operations provides for government management of the GMD program. Included in this effort is program and business management, program administration, technical and testing oversight, verification of hardware and software development, quality / safety / mission assurance, integrated logistics support, and government manpower and infrastructure to develop, test and sustain the GMD system and components.</p> <p>FY 2016 Accomplishments:</p> <p>-Provided technical and business management support activities, financial management, cost and schedule performance analysis, cost estimation and analysis, configuration management and integration activities to ensure program met cost, schedule, and performance goals</p> <p>-Ensured Ground-based Midcourse Defense (GMD) program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process</p> <p>-Conducted internal Director's Program Review (DPR) to measure program progress against the six Missile Defense Agency (MDA) approved baselines</p> <p>-Continued a Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety in all phases of the system life cycle, throughout the supply chain and at all levels of assembly emphasizing high yield rates which minimize test and rework costs</p>		86.325	85.639	74.216
		Articles:	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>-Provided Quality Safety and Mission Assurance (QSMA) operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered to the Warfighter</p> <p>-Continued sustainment of core information technology data and unified communications services to accomplish research and development activities.</p> <p>FY 2017 Plans:</p> <p>-Provide technical and business management support activities, financial management, cost and schedule performance analysis, cost estimation and analysis, configuration management and integration activities to ensure program met cost, schedule, and performance goals</p> <p>-Ensure GMD program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process</p> <p>-Conduct internal Director's Program Review (DPR) to measure program progress against the six Missile Defense Agency (MDA) approved baselines</p> <p>-Continue a Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs</p> <p>-Provide Quality Safety and Mission Assurance (QSMA) operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety, and reliability to ensure high quality products are delivered to the Warfighter</p> <p>-Continue sustainment of core information technology data and unified communications services to accomplish research and development activities</p> <p>FY 2018 Plans:</p> <p>-Decrease from FY 2017 to FY 2018 reflects efficiencies in Contract Support Services experienced through competition.</p> <p>-Continue technical and business management support activities, financial management, cost and schedule performance analysis, cost estimation and analysis, configuration management and integration activities to ensure program met cost, schedule, and performance goals</p> <p>-Continue to ensure GMD program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process</p> <p>-Conduct internal DPR to measure program progress against the six MDA approved baselines</p> <p>-Continue a Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety in all phases of the system life cycle, throughout the supply chain and at all levels of assembly emphasizing high yield rates which minimize test and rework costs</p> <p>-Continue QSMA operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered to the Warfighter</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
-Continue sustainment of core information technology data and unified communications services to accomplish research and development activities				
Title: Ground Systems & Fire Control		163.714	117.369	212.732
		Articles:	-	-
<p>Description: The GMD Ground Systems enable control and operation of the GMD Element as part of the Ballistic Missile Defense System (BMDS). Ground Systems consists of the GMD Fire Control system, GMD Communications Network, In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT), Launch Site Components (LSC) (silos, silo interface vaults [SIVs]), and the Launch Support Systems (LSS) (Command and Launch Equipment (CLE), which includes Launch Support Equipment (LSE).</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Initiated requirements and preliminary design efforts for IDT technology upgrades to support enhanced data rates and message sets required for the On-Demand Communications to the Redesigned Kill Vehicle -Tested Ground Systems suite 6B3 in CTV-02+ flight test and ground tests, and initiate fielding of software upgrade for Near-Term Discrimination (NTD) capability, and Near-term BMDS discrimination improvements capability, including limited Reliability/Obsolescence/Technology Refresh of the Ground System hardware to the Warfighter -Continued design and development for Ground Systems suite 7A to integrate limited IDT component upgrades, and CLE/GFC Re-architecture Phase I, and interface with C2BMC build 8.2 -Continued Ground Systems suite 7B upgrades for mid-term discrimination improvements to provide data aggregation, update salvo-logic, midterm threat set, 2-stage interceptor capability, and on-demand communications supporting Redesigned Kill Vehicle capabilities (RKV), into the GMD configuration -Continued Technology Refresh to address obsolescence issues to support improved availability, reliability, sustainability, and Cybersecurity posture -Completed integration efforts for an In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT) at Fort Drum, NY to provide increased system performance in specific engagement scenarios -Completed the refurbishment, upgrade, blast shielding, and hardening of Missile Field 1 at Fort Greely, Alaska -Continued the Command Launch Equipment (CLE)/GFC Re-architecture Phase 1 to mitigate obsolescence, and increase reliability, sustainability, and availability of the CLE with added failover capability <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> -Continue the CLE/ GMD Fire Control system (GFC) Re-architecture Phase 1 to mitigate obsolescence, and increase reliability, sustainability, and availability of the CLE with added failover capability -Complete fielding of Ground Systems suite 6B3 software upgrade for Near-Term Discrimination (NTD) capability, and Near-term BMDS discrimination improvements capability, including limited Reliability/Obsolescence/Technology Refresh of the Ground System hardware to the Warfighter 				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>-Complete design and development for Ground Systems suite 6B3.2 to integrate limited In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT) component upgrades, and CLE/GFC Re-architecture Phase I, and interface with Command & Control, Battle Management, Communications (C2BMC) build 8.2</p> <p>-Continue Ground Systems suite 7B upgrades for Mid-Term discrimination improvements capabilities in addition to the 2 stage options using Energy Maneuvers and Zero Pulse, and 2/3 stage Battle Management; upgrade interfaces to IDT to support On-Demand Communications and Warfighter Enhancements. The 7B suite will also include improved Nuclear Weapons Effects (NWE) planning, Missile Order of Battle (MOB) updates, Boost Phase Cueing from AN/TPY-2 radars, and Risk Management Framework (RMF) start up</p> <p>-Continue detailed design development of the IDT technology upgrades to support the On-Demand Communications capability for systems discrimination data, directed engagements and hit assessments</p> <p>-Continue GMD Communications Network (GCN) Modernization efforts to support GMD system expansion and emerging requirements, enhance/maintain Cyber Security posture, and mitigate hardware and software obsolescence</p> <p>FY 2018 Plans:</p> <p>-Increase from FY 2017 to FY 2018 provides GCN and IDT modernization/upgrades, development of version 8 software, and to begin work to ensure no fewer than 44 GBIs are deployed through the FYDP</p> <p>-Complete development of 6B3 software upgrades as determined during fielding and integration into current hardware systems</p> <p>-Continue production and deployment of CLE/GFC re-architecture hardware suites to mitigate obsolescence and increase reliability, sustainability, and availability of GMD fire control systems</p> <p>-Complete development for Ground Systems software suite 6B3.2 integrating limited In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT) component upgrades, and CLE/GFC re- architecture, and interface with Command & Control, Battle Management, and Communications (C2BMC) build 8.2</p> <p>-Continue development and production of the IDT technology upgrades to support On-Demand Communications capability for systems discrimination data, directed engagement and hit assessments</p> <p>-Complete design and development of 7B upgrades for Mid-Term discrimination improvements; upgrade interfaces to IDT to support On-Demand Communications and Warfighter enhancements</p> <p>-Continue GMD Communications Network (GCN) Modernization efforts to support GMD system expansion and emerging requirement, enhance/maintain Cybersecurity posture, and mitigate hardware and software obsolescence</p> <p>-Continue design and development of the version 8 software build that allows implementation of BMDS system track within GMD Ground Systems as well as Mid-Term Discrimination upgrades</p> <p>-Continue planning and implementation of space optimization renovations in the Readiness and Control (R&C) building at Ft Greely, AK for best use by the Warfighter</p> <p>- Initiate system upgrades to the Readiness and Control (R&C) building in Fort Greely, Alaska. The upgrades will maximize shielded protection to vital systems and provide more operational space for the Warfighters</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-Continue design and development of software upgrades for Shoot-Assess-Shoot supported by GMD Post-Intercept Assessment utilizing GMD sensors -Initiate system upgrades to the Readiness and Control (R&C) building in Fort Greely, Alaska. The upgrades will provide maximize shielded protection to vital systems and provide more operational space for the Warfighters			
Accomplishments/Planned Programs Subtotals	1,193.273	815.796	777.692

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0203882C: MD08: <i>GMD O&M</i>	133.705	129.281	137.896	-	137.896	143.027	139.319	142.269	145.188	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing
• 0604874C: <i>Improved Homeland Defense (HLD) Interceptors</i>	282.864	274.148	465.530	-	465.530	496.414	532.984	635.749	627.388	Continuing	Continuing
• 0604887C: <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	54.619	56.481	76.757	-	76.757	74.205	69.713	77.826	79.094	Continuing	Continuing
• 0604894C: <i>Multi Object Kill Vehicle</i>	0.000	71.513	6.500	-	6.500	3.500	229.524	209.830	265.898	0	786.765

Remarks

D. Acquisition Strategy

The GMD program will continue to follow testing, development, and evolutionary acquisition through incremental development. The Agency acquisition strategy ensures GMD components are upgraded to improve both All-Up System (AUS) performance and All-Up Round (AUR) performance in order to retain the proven GMD contribution to the Integrated BMDS. This acquisition approach reduces obsolescence risk, provides opportunities for incremental capability improvements, and allows decision makers to make informed trades between cost, schedule, and performance while exploring improved operational and technological capabilities.

GMD awarded a competitive Development and Sustainment Contract (DSC) on December 30, 2011. This contract continues development, fielding, test, systems engineering, integration, and configuration management; equipment manufacturing and upgrade; training, operations and sustainment of the GMD system and associated support facilities. The DSC emphasizes the application of performance-based tenets to provide timely high quality support of the core GMD system while reducing life cycle and long-term ownership costs. GMD's acquisition strategy for transition of the legacy content into the DSC provides uninterrupted field operations;

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
0400 / 4	PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	MD08 / <i>Ground Based Midcourse</i>

development of both Ground Systems and GBI products, including manufacturing additional interceptors to support both operations and testing and the requirement to demonstrate war fighting capability through a rigorous ground and flight test program.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Ground Based Interceptor Development - Configuration 2 CBAU Booster Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	11.906	38.448	Nov 2015	0.116	Nov 2016	1.005	Nov 2017	-		1.005	0	51.475	0
Ground Based Interceptor Development - Configuration 3 Booster Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.954	Nov 2015	0.000		0.000		-		0.000	0	0.954	0
Ground Based Interceptor Development - EKV New & Modified Component Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.363	21.968	Nov 2015	2.365	Nov 2016	0.000		-		0.000	0	24.696	0
Ground Based Interceptor Development - Flight Rotations for Ballistic Missile Defense System Level Testing	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	13.441	18.868	Nov 2015	25.866	Nov 2016	6.383	Nov 2017	-		6.383	Continuing	Continuing	Continuing
Ground Based Interceptor Development - Obsolescence work to ensure the number of deployed GBIs does not fall below 44	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		0.000		36.999	Nov 2017	-		36.999	Continuing	Continuing	Continuing
Ground Based Interceptor Development - Operational Spares	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	12.155	5.268	Nov 2015	13.751	Nov 2016	0.000		-		0.000	0	31.174	0
Ground Based Interceptor Development - Prior year no longer funded in the FYDP	Various	Various : Various	35.541	0.000		0.000		0.000		-		0.000	0	35.541	0
Ground Based Interceptor Development - Software Maintenance & Updates	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	15.750	12.711	Nov 2015	11.032	Nov 2016	27.002	Nov 2017	-		27.002	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Based Interceptor Manufacturing - Additional Boosters for Flight Testing	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		14.871	Nov 2016	13.000		-		13.000	Continuing	Continuing	Continuing
Ground Based Interceptor Manufacturing - Booster work to ensure no fewer than 44 GBIs are deployed through the FYDP	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		0.000		30.467	Nov 2017	-		30.467	Continuing	Continuing	Continuing
Ground Based Interceptor Manufacturing - GBI Prime Product Support	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	66.987	124.502	Nov 2015	84.754	Nov 2016	39.190	Nov 2017	-		39.190	Continuing	Continuing	Continuing
Ground Based Interceptor Manufacturing - Interceptor Manufacturing Support	MIPR	NASA MSFC& AMRDEC, HSV, AL : Draper Laboratory, MA; Vanguard, HSV, AL	5.917	5.959	Nov 2015	6.542	Nov 2016	2.680	Nov 2017	-		2.680	Continuing	Continuing	Continuing
Ground Based Interceptor Manufacturing - Prime Ground Based Interceptors 34-44 (CE-II)	C/CPAF	Boeing AL/AK/AZ : CA/CO/TX/VA	99.644	16.124	Nov 2015	0.000		0.000		-		0.000	0	115.768	0
Ground Based Interceptor Manufacturing - Prime Ground Based Interceptors 48-58 (CE-II Block 1)	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	185.517	329.614	Nov 2015	135.470	Nov 2016	39.935	Nov 2017	-		39.935	Continuing	Continuing	Continuing
Ground Based Interceptor Reliability - Government Reliability Program	MIPR	AMRDEC / Redstone Arsenal, AL : NSWC Crane, IN	6.470	6.919	Nov 2015	8.499	Nov 2016	5.946	Nov 2017	-		5.946	Continuing	Continuing	Continuing
Ground Based Interceptor Reliability - Prime Currently Fielded CE-II Upgrades	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	12.497	59.990	Nov 2015	10.297	Nov 2016	0.000		-		0.000	0	82.784	0
Ground Based Interceptor Reliability - Prime GBI Functional Testing	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	1.175	15.850	Nov 2015	9.002	Nov 2016	9.599	Nov 2017	-		9.599	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Ground Based Interceptor Reliability - Prime Reliability & Systems Engineering	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	5.318	2.624	Nov 2015	2.661	Nov 2016	0.000		-		0.000	0	10.603	0
Ground Based Interceptor Reliability - Prime Reliability Program	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	18.100	7.318	Nov 2015	20.367	Nov 2016	6.929	Nov 2017	-		6.929	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Government Fort Drum IDT	MIPR	MDA/AL : /VA/NY	0.564	0.012	Nov 2015	0.420	Nov 2016	0.000		-		0.000	0	0.996	0
Ground Systems & Fire Control - Government Software Development	MIPR	AMRDEC : Redstone Arsenal, AL	0.000	1.131	Nov 2015	1.320	Nov 2016	8.181	Nov 2017	-		8.181	Continuing	Continuing	Continuing
Ground Systems & Fire Control - MF-1 work to ensure no fewer than 44 GBIs are deployed through the FYDP	TBD	TBD : AL/AK	0.000	0.000		0.000		56.534	Nov 2017	-		56.534	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime CLE Re-Architecture	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	10.301	36.308	Nov 2015	14.217	Nov 2016	4.031	Nov 2017	-		4.031	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Communications Infrastructure	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	2.369	1.875	Nov 2015	3.191	Nov 2016	1.116	Nov 2017	-		1.116	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Fort Drum IDT	C/CPIF	Boeing AL : CO/NY/VA	9.084	0.959	Nov 2015	0.000		0.000		-		0.000	0	10.043	0
Ground Systems & Fire Control - Prime Ground Systems Software Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	233.427	65.960	Nov 2015	60.372	Nov 2016	71.521	Nov 2017	-		71.521	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Ground Systems & Fire Control - Prime MF-1 Repair and Refurbishment	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	17.493	18.146	Nov 2015	0.000		0.000		-		0.000	0	35.639	0
Ground Systems & Fire Control - Prime On Demand Communications	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	0.000	0.000		19.551	Nov 2016	16.521	Nov 2017	-		16.521	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Post-Intercept Assessment	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	0.000	0.000		0.000		4.840	Nov 2017	-		4.840	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Technology Refresh	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	15.457	39.323	Nov 2015	18.298	Nov 2016	49.988	Nov 2017	-		49.988	Continuing	Continuing	Continuing
Subtotal			779.476	830.831		462.962		431.867		-		431.867	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering and Program Management - Cyber Security	MIPR	MDA : AL/VA	0.000	0.000		9.010	Nov 2016	0.000		-		0.000	0	9.010	0
Systems Engineering and Program Management - Discrimination Engineering & Analysis	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		9.643	Nov 2016	9.980	Nov 2017	-		9.980	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government Discrimination Improvements	MIPR	FFRDC/UARC : AL	2.091	3.308	Nov 2015	6.000	Nov 2016	7.069	Nov 2017	-		7.069	Continuing	Continuing	Continuing
Systems Engineering and Program Management -	MIPR	AEDC : Tullahoma, TN	14.452	6.857	Nov 2015	7.088	Nov 2016	7.230	Nov 2017	-		7.230	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government EKV HWIL Tests in Space Chamber															
Systems Engineering and Program Management - Government Modeling and Simulation	MIPR	SED and Morrow Labs : Redstone Arsenal/AL	44.093	24.094	Nov 2015	29.744	Nov 2016	18.610	Nov 2017	-		18.610	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government Systems Engineering & Integration	MIPR	AMRDEC : HSV/AL	4.501	22.739	Nov 2015	18.303	Nov 2016	47.929	Nov 2017	-		47.929	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Information Management & Technology Ops	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	3.209	13.311	Nov 2015	9.269	Nov 2016	13.210	Nov 2017	-		13.210	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Model & Simulations Industry Support	C/CPAF	Northrop Grumman : AI, VA	0.000	2.539	Nov 2015	0.000		0.000		-		0.000	0	2.539	0
Systems Engineering and Program Management - Model & Simulations Support	Allot	MDA : AL/VA	21.478	9.971	Oct 2015	10.651	Oct 2016	9.507	Oct 2017	-		9.507	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime Design, Readiness, Analysis and Reporting	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		14.729	Nov 2016	20.650	Nov 2017	-		20.650	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime Discrimination Improvements	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	6.575	30.274	Nov 2015	13.100	Nov 2016	8.142	Nov 2017	-		8.142	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime EKV HWIL Tests in Space Chamber	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	65.301	1.614	Nov 2015	1.645	Nov 2016	1.678	Nov 2017	-		1.678	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Program Management - Prime Modeling and Simulation	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	151.350	19.490	Nov 2015	13.864	Nov 2016	14.502	Nov 2017	-		14.502	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime Program Management	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	122.488	57.987	Nov 2015	51.722	Nov 2016	53.293	Nov 2017	-		53.293	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime System Engineering and Integration	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	297.034	33.482	Nov 2015	43.579	Nov 2016	27.741	Nov 2017	-		27.741	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis	MIPR	Various : AL/VA	16.552	6.401	Nov 2015	3.299	Nov 2016	5.149	Nov 2017	-		5.149	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis - CSS Support	C/CPFF	MiDAESS/TEAMS : AL	0.000	8.770	Nov 2015	2.945	Nov 2016	2.846	Nov 2017	-		2.846	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis - FFRDC / UARC	MIPR	Various : AL/VA	0.583	1.453	Nov 2015	1.019	Nov 2016	2.543	Nov 2017	-		2.543	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis - Industry Support	C/CPAF	Boeing : AL	8.300	6.493	Nov 2015	5.876	Nov 2016	5.810	Nov 2017	-		5.810	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis - Threat Analysis / FFRDC / UARC	MIPR	Various : AL, VA	0.000	6.897	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering and Program Management - Technical Direction Agent	MIPR	AL/CA/GA/MA : MD/ NM/UT/VA	0.000	20.437	Oct 2015	15.709	Oct 2016	15.720	Nov 2017	-		15.720	Continuing	Continuing	Continuing
Program Operations - Contract Support Services	C/CPFF	Various : AL/AK/CA/ CO/VA	363.314	42.597	Oct 2015	37.338	Oct 2016	28.895	Oct 2017	-		28.895	Continuing	Continuing	Continuing
Program Operations - FFRDC Support	MIPR	MIT/LL : AL/VA/CO	41.965	2.729	Oct 2015	8.525	Oct 2016	4.674	Oct 2017	-		4.674	Continuing	Continuing	Continuing
Program Operations - Government Civilian Salaries	MIPR	MDA : AL/VA	204.096	32.168	Oct 2015	30.263	Oct 2016	31.822	Oct 2017	-		31.822	Continuing	Continuing	Continuing
Program Operations - Information Technology Services	MIPR	MDA : AL/CA/VA/ CO/AK	2.923	0.524	Nov 2015	1.227	Nov 2016	1.256	Nov 2017	-		1.256	Continuing	Continuing	Continuing
Program Operations - Other Govt Agencies	MIPR	Various : AL/VA/FL/ CO	35.138	6.644	Oct 2015	6.654	Oct 2016	5.869	Oct 2017	-		5.869	Continuing	Continuing	Continuing
Program Operations - Safety and Quality	MIPR	MDA : AL/AK/CA/VA	0.503	0.064	Nov 2015	0.081	Nov 2016	0.016	Nov 2017	-		0.016	Continuing	Continuing	Continuing
Program Operations - Travel	MIPR	MDA : AL/VA	6.091	1.599	Oct 2015	1.551	Oct 2016	1.684	Oct 2017	-		1.684	Continuing	Continuing	Continuing
Subtotal			1,412.037	362.442		352.834		345.825		-		345.825	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,191.513	1,193.273	815.796	777.692	-	777.692	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>
--	--	--

	Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆											
	Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇											
	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
Fort Drum, NY IDT	◆																											
Deliver GBI 41	◆																											
Missile Field 1 Refurbishment and Upgrade	◆	◆	◆	◆																								
CLE Re-architecture	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇												
Communications Infrastructure	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇				
Ground Based Interceptors Rotation and Upgrades	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Technology Refresh	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Deliver GBIs (48-50)				◇	◇																							
On Demand Communications					◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇								
Deliver GBIs (51-53)						◇	◇	◇																				
Ground Systems 7A Mid Term (FQT)							◇																					
Deliver GBIs (54-58)								◇	◇	◇																		
Post-Intercept Assessment Start									◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Ground Systems 7B Mid Term DIHD (FQT)												◇																

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD08 / <i>Ground Based Midcourse</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Fort Drum, NY IDT	1	2016	1	2016
Deliver GBI 41	1	2016	1	2016
Missile Field 1 Refurbishment and Upgrade	1	2016	4	2016
CLE Re-architecture	1	2016	4	2019
Communications Infrastructure	1	2016	4	2021
Ground Based Interceptors Rotation and Upgrades	1	2016	4	2022
Technology Refresh	1	2016	4	2022
Deliver GBIs (48-50)	4	2016	1	2017
On Demand Communications	1	2017	4	2020
Deliver GBIs (51-53)	2	2017	4	2017
Ground Systems 7A Mid Term (FQT)	3	2017	3	2017
Deliver GBIs (54-58)	4	2017	2	2018
Post-Intercept Assessment Start	1	2018	4	2022
Ground Systems 7B Mid Term DIHD (FQT)	4	2018	4	2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>				Project (Number/Name) MC08 / <i>Cyber Operations</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC08: <i>Cyber Operations</i>	6.848	14.686	4.563	18.818	-	18.818	22.495	23.766	22.702	16.623	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Increase from FY 2017 to FY 2018 is due to increased efforts to mitigate cyber security threats.

A. Mission Description and Budget Item Justification

The funding in this project sustains MDA Risk Management Framework and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA GMD mission systems. It maintains the Assessment and Authorization A&A data repository, capturing the RMF documentation (artifacts, validation results, and Cybersecurity Risk Assessment results, and Authorization decisions) and POA&Ms on all MDA information systems.

This project supports the monitoring and tracking of Cybersecurity mitigations detailed in Information Technology security POA&Ms. Activities include preparation of A&A documentation and authorization recommendations to the MDA Senior Information Assurance Officer (SIAO)/ Security Control Assessor (SCA), and Authorizing Official (AO). Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Systems Modernization Act (FISMA) 2014.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network / System Certification and Accreditation (C&A)	5.689	4.563	4.763
Articles:	-	-	-
Description: Sustains the MDA Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information System Security Manager (PM/ISSM) Plans of Action and Milestones (POA&Ms) for MDA Ground-based Midcourse Defense (GMD) mission system. It maintains the Assessment and Authorization (A&A) data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Authorization Official (AO) accreditation decisions) and POA&M on all MDA information systems. Provides GMD Information Assurance Manager (IAM) civilian salaries. Conduct cyber security/ Information Assurance (IA) engineering and architecture planning for GMD information technology systems. Plan and test IA controls for BMDS GMD systems. Conduct Controls Validation Testing (CVT) of GMD mission systems and provide Plan of Action and Milestones to mitigate IA deficiencies. Conduct annual information assurance reviews on the GMD enclaves to assess compliance in implementing and maintaining IA controls. Developd GMD DoD Information Assurance Certification and Accreditation Program (DIACAP) certification and accreditation packages. Develop GMD DoD Risk Management Framework (RMF) Assessment and Authorization packages.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>FY 2016 Accomplishments: see above</p> <p>FY 2017 Plans: see above</p> <p>FY 2018 Plans: see above</p>				
<p>Title: Cybersecurity</p> <p align="right">Articles:</p> <p>Description: Implements the GMD Cybersecurity Program and Defense in Depth Cybersecurity Strategy for the GMD Weapon System's Research, Development, Test, and Operational Mission Environment Systems, Networks, and Enclaves to ensure Confidentiality, Integrity, and Availability of the System to the Warfighter.</p> <p>FY 2016 Accomplishments: -Initiated enhancement of the cybersecurity posture and further compliance with Risk Management Framework criteria -Initiated cybersecurity Operations Upgrade Program consisting of efforts to enhance the cybersecurity posture of the GMD operational information systems and its supporting information systems and components</p> <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans: -Increase from FY 2017 to FY 2018 is due to increased efforts to mitigate cyber security threats.</p> <p>-Continue assessing, implementing, documenting, and validating up to 512 cybersecurity control families (1935 security protections and control enhancements) for 25 representative systems which are comprised of 250,000 computing and logic bearing components supporting the GMD Development, Test, Training, and Operational missions. This will result in improved Confidentiality, Integrity, and Availability of the GMD System while ensuring mandatory compliance with Risk Management Framework</p> <p>-Continue implementing necessary upgrades to enhance the cybersecurity posture of the GMD operational environments and it's supporting information systems and networks while remaining responsive to active or emerging cyber threats against GMD</p> <p>-Continue ensuring compliance with security mandates to maintain continued authorization to operate while eliminating or reducing risks assessed against the program by implementing vulnerability mitigation activities</p>		8.997 -	0.000 -	14.055 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-Continue protecting the GMD systems through the incorporation of a Defense-in-depth cybersecurity strategy which requires a fully qualified cybersecurity workforce to include training and certification of nearly 450 Cybersecurity Workforce personnel involved in developing, operating, and maintaining GMD test, training, and mission support information systems and networks and enclaves at various GMD locations such as: Vandenberg Air Force Base, CA; Fort Greely, AK; Fort Drum, NY; and the Missile Defense Integration Operations Center in Colorado Springs, CO			
Accomplishments/Planned Programs Subtotals	14.686	4.563	18.818

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0203882C: MD08: <i>GMD O&M</i>	133.705	129.281	137.896	-	137.896	143.027	139.319	142.269	145.188	Continuing	Continuing
• 0604874C: <i>Improved Homeland Defense (HLD) Interceptors</i>	282.864	274.148	465.530	-	465.530	496.414	532.984	635.749	627.388	Continuing	Continuing
• 0604887C: <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	54.619	56.481	76.757	-	76.757	74.205	69.713	77.826	79.094	Continuing	Continuing

Remarks

D. Acquisition Strategy
GMD uses the cybersecurity funding to apply security engineering principles to acquire, design, test, implement and field technical solutions throughout the systems architecture to ensure sufficient protections exist from a threat and risk based approach. To achieve this, cybersecurity protection requirements must be validated and properly flowed into system requirements and design specifications early enough to provide the most cost benefit. Many BMDS systems are now or within the very near future undergoing tech-refresh and so the opportunity to receive the most benefit of implementing the more stringent protections is at hand and aligns with the proposed budget as submitted.

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C&A) - Civilian Salaries	MIPR	MDA : AL/VA	1.537	0.791	Oct 2015	0.826	Oct 2016	1.026	Oct 2017	-		1.026	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Contract Support Services	C/CPFF	Booz Allen Hamilton, AI : Torch Technologies, AI	5.311	4.898	Nov 2015	3.737	Nov 2016	3.737	Nov 2017	-		3.737	Continuing	Continuing	Continuing
Cybersecurity - Cybersecurity	MIPR	SMDC : Redstone Arsenal, AL	0.000	5.653	Nov 2015	0.000		8.000	Nov 2017	-		8.000	Continuing	Continuing	Continuing
Cybersecurity - GMD Cybersecurity Program	C/CPIF	Boeing : AL	0.000	0.469	Jun 2016	0.000		0.924	Nov 2017	-		0.924	Continuing	Continuing	Continuing
Cybersecurity - Ground Systems Software Cybersecurity	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	0.000	2.875	Nov 2015	0.000		5.131	Nov 2017	-		5.131	Continuing	Continuing	Continuing
Subtotal			6.848	14.686		4.563		18.818		-		18.818	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.848	14.686	4.563	18.818	-	18.818	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>
--	--	--

	Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆									
	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇									
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
GMD Cybersecurity Mitigation Monitoring and Tracking	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
GMD Cybersecurity Program Policy / Risk Management	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
GMD Information Assurance Certification and Accreditation (C&A) Package Preparation/Submission	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
GMD Transition to Cybersecurity Risk Management Framework (CRMF)	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
BMDS Cybersecurity Policy Development	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MC08 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GMD Cybersecurity Mitigation Monitoring and Tracking	1	2016	4	2022
GMD Cybersecurity Program Policy / Risk Management	1	2016	4	2022
GMD Information Assurance Certification and Accreditation (C&A) Package Preparation/ Submission	1	2016	4	2022
GMD Transition to Cybersecurity Risk Management Framework (CRMF)	1	2016	4	2022
BMDS Cybersecurity Policy Development	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	182.891	52.521	41.721	31.587	-	31.587	28.361	28.671	25.994	26.038	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016 and FY 2017, Program Wide Support reflects proportional changes as a result of decreases in Ballistic Missile Defense Midcourse Defense Segment. FY 2018 reflects proportional changes as a result of decreases in Ballistic Missile Defense Midcourse Defense Segment. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	52.521	41.721	31.587
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	52.521	41.721	31.587

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	12.685	1.503	Mar 2016	0.750	Jul 2017	0.632	Jul 2018	-		0.632	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	MDA : Multi: AK, AL, CA, CO, VA	132.843	30.796	Oct 2015	30.681	Oct 2016	30.348	Oct 2017	-		30.348	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (FFP)	C/FFP	PHACIL, INC : Multi: AK, AL, CA, CO, VA	12.430	0.000		10.290	Jul 2017	0.607	Jul 2018	-		0.607	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPR)	MIPR	Various : Multi: AK, AL, CO, CA, HI, VA	17.444	8.854	Apr 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL, CA, CO, HI, VA	2.257	11.368	Feb 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Sustainment Transportation	Reqn	Various : AK, AL, CA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	C/CPFF	Utah St Univ; JHU/ APL LLC : Multi: MD, UT	1.372	0.000		0.000		0.000		-		0.000	3.500	4.872	0
Program Wide Support - Facilities and Maintenance	MIPR	Various : Multi: AK, AL, CA, VA	3.860	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			182.891	52.521		41.721		31.587		-		31.587	-	-	-

Remarks
Support is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	182.891	52.521	41.721	31.587	-	31.587	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency										Date: May 2017									
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense</i> <i>Midcourse Defense Segment</i>					Project (Number/Name) MD40 / <i>Program-Wide Support</i>									
Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆											
Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇											
					FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		
MD40 Program-Wide Support					◇◇◇◇◇		◇◇◇◇◇		◇◇◇◇◇		◇◇◇◇◇		◇◇◇◇◇		◇◇◇◇◇		◇◇◇◇◇		

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / <i>Ballistic Missile Defense Midcourse Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	932.886	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
MD11: <i>BMDs Radars</i>	864.338	221.705	219.503	213.532	-	213.532	211.357	241.261	299.852	260.420	Continuing	Continuing
MD41: <i>Pacific Radar</i>	-	0.000	0.000	21.000	-	21.000	25.800	99.000	83.300	216.060	0	445.160
MC11: <i>Cyber Operations</i>	2.675	1.196	1.045	3.636	-	3.636	1.089	8.950	4.410	1.156	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	65.873	10.119	9.529	9.177	-	9.177	9.397	13.639	13.705	19.867	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense System (BMDS) network of layered Sensors provides essential situational awareness and fire control data for the command and control of BMDS weapon systems, such as Ground-based Midcourse Defense (GMD), Aegis Ballistic Missile Defense, and Terminal High Altitude Area Defense (THAAD). The suite of remote ground-based sensors provides early warning, midcourse and terminal ballistic missile defense threat data enabling layered detection and tracking of ballistic missile targets, providing fire-control quality position, velocity, and discrimination data through Ground-Based Midcourse Defense Fire Control (GFC), or Command and Control, Battle Management, Communications (C2BMC).

Overlapping coverage of geographically diverse sensors provides improved threat track data, reduces the impact of the loss of any one sensor, and reduces the potential impact of countermeasures. The extended coverage and accuracy provided by a network of layered sensors increases the defensive footprint and reduces the number of target engagements required, thereby conserving interceptor inventory and maintaining a high probability of successful engagement. Networked forward-based sensors enable C2BMC to pair the best sensor coverage with the best available weapon system to provide the most effective defense against ballistic missile threats.

This Program Element includes BMDS threat discrimination improvements, which will enhance BMDS effectiveness against the evolving adversary threat. The result will be a BMDS architecture more capable of discriminating and destroying reentry vehicles with a higher degree of confidence, improving Warfighter shot doctrine, and more efficiently using interceptor inventory. BMDS threat discrimination improvements are funded from the Enabling (0603890C), Midcourse (0603882C), BMD Sensors (0603884C), C2BMC (0603896C), and Aegis BMD (0603892C) PEs.

The BMD Sensors Program contributes to regional missile defense through the development, delivery and deployment/redeployment of Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2) radars for operations or tests. AN/TPY-2 radars can be configured to operate either as a THAAD Fire Unit Radar (terminal mode) or Forward-Based Radar. These radars are transportable, adding flexibility to respond to geographical changes in threats. Radars provide early warning tracking and discrimination data through all phases of ballistic missile flight. Through the BMDS C2BMC and coalition data links, the AN/TPY-2 provides fire control data to enable

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>
---	--

remote Standard Missile (SM)-3 engagements by Aegis BMD, to allow earlier engagement by the Arrow Weapon System, and to cue deployed THAAD and U.S. and partner PATRIOT batteries.

The BMDS sensor network also includes the COBRA DANE Radar at Eareckson Air Station, Alaska, and the Upgraded Early Warning Radars (UEWRs) at Beale Air Force Base, CA; Fylingdales Royal Air Force, United Kingdom, and Thule Air Base in Greenland. The Clear Ultra High Frequency Early Warning Radar (EWR), at Clear Air Force Station, AK, and the Cape Cod EWR, at Cape Cod Air Force Station, MA, are also being upgraded to include missile defense functionality against long-range threats in addition to their existing Missile Warning and Space Surveillance missions. Upgrade activities began in CY 2012 and are expected to be completed in CY 2017 and 2018 respectively. The addition of the Clear UEWR and Cape Cod UEWRs to the BMDS sensor architecture will improve BMDS sensor coverage and provide new engagement options against long-range missile threats.

The Pacific Radar is a new sensor within the Ballistic Missile Defense System that addresses NORTHCOM and PACOM radar requirements for the defense of Hawaii. The Pacific Radar is an long range ballistic missile defense sensor that provides a persistent operational capability for the defense of the Pacific region and improves the discrimination capability to address multiple threats including the no warning strategic challenges of the road mobile ICBM. The radar will leverage development efforts from other sensors projects to reuse discrimination, low elevation acquisition, and tracking algorithms. The Pacific Radar final testing/integration and delivery is planned for CY 2023.

Cyber Operations sustains the Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of Plans of Action and Milestones (POA&Ms) for the Sensors mission system.

This Program Element also investigates concepts and performs systems engineering to address hypersonic threats.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	228.392	230.077	144.893	-	144.893
Current President's Budget	233.020	230.077	247.345	-	247.345
Total Adjustments	4.628	0.000	102.452	-	102.452
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	9.606	0.000			
• SBIR/STTR Transfer	-4.978	0.000			
• Other Adjustment	0.000	0.000	102.452	-	102.452

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>
---	--

Change Summary Explanation

The increase from PB17 to PB18 in FY2018 reflects funding for the new Pacific Radar, a long range BMD sensor that addresses NORTHCOM and PACOM radar requirements for the defensive of Hawaii, and studies for a potential Atlantic Radar. The increase also reflects AN/TPY-2 transition to Gallium Nitride (GaN) Transmit/Receive module technology, software improvements to implement C2BMC interface updates, and Objective Debris Mitigation (ODM). Increased funding for Cyber Operations reflects compliance with new Cyber Supply Chain requirements. Also includes reduced contract spending for Mission Support Services in accordance with Department Service Requirement Review Board reductions through increased competition.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD11: <i>BMDS Radars</i>	864.338	221.705	219.503	213.532	-	213.532	211.357	241.261	299.852	260.420	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The BMDS Radars project includes development of future Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2), COBRA DANE and Upgraded Early Warning Radar (UEWR) capabilities through system engineering, software development and testing support. Modeling and Simulation (M&S) efforts include enhanced sensor models, development of Radio Frequency scene generators, integration of digital simulations into the Ballistic Missile Defense System (BMDS) M&S architecture, and Verification, Validation, and Accreditation of radar models. This project funds participation and support for Ballistic Missile Defense System (BMDS) element ground and flight test campaigns and Warfighter games and exercises.

This project will continue development of discrimination advanced algorithms for the AN/TPY-2, COBRA DANE, Sea Based X-Band, and the UEWR radars to counter evolving threats. The discrimination improvement effort will develop and field integrated Element capabilities to improve BMDS's ability to identify lethal and non-lethal objects. Sensors will continue development of discrimination improvement Mid-term design and test support for SBX and Far-term trade analysis and planning.

Program Operations provides strategic planning, program integration, cost estimating, contracting, financial management, internal reviews and audits, earned-value management and program assessments for the program office.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Basic Development Program	38.529	35.279	25.004
Articles:	-	-	-
Description: The Basic Development Program includes development and testing of software maintenance updates to address software trouble reports identified on fielded SW versions and flight/ground test events. Software maintenance updates also includes annual cybersecurity certifications and accreditations, testing for vulnerabilities and third party assessments of all sensors systems. Software improvement efforts also include optimization of increased processing capabilities. The Basic Development Program also provides analysis of software performance during flight and ground testing of Phased Adaptive Approach (PAA) Phases II and III to conduct Materiel Release Analysis for software delivery. The Materiel Release Closure Plan for the Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2) ensures the Reliability, Availability, and Maintainability (RAM) Program promotes reliability growth in the suite of AN/TPY-2 radars via product improvements. Specific and/or unique accomplishments to each FY are as follows:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> -Completed UEWR development for the reinforcement of the surveillance fence resulting in increased probability of target acquisition -Completed the scheduled transition of the Ground Based Radar Prototype (GBR-P) to the U.S. Army Space and Missile Defense Command (SMDC) -Completed urgent materiel release to field software to CENTCOM/EUCOM that is compatible with both the legacy superdome signal data processor and new X86 version</p> <p><i>FY 2017 Plans:</i> -Initiate delivery of new software build for AN/TPY-2 that incorporates new development capabilities and repairs for identified software maintenance issues</p> <p><i>FY 2018 Plans:</i> -Decrease reflects completion of new software build delivery for AN/TPY-2 that incorporates new development capabilities and repairs for identified software maintenance issues</p>			
<p><i>Title:</i> BMDS Radars Modeling & Simulation (M&S)</p> <p align="right"><i>Articles:</i></p> <p><i>Description:</i> BMDS Radars M&S efforts include enhanced sensor models, development and maintenance of Radio Frequency (RF) scene generators, integration of digital simulations into the Ballistic Missile Defense System (BMDS), M&S architecture, and Verification, Validation, and Accreditation of radar models. This effort includes support for technical and performance assessments, using Open Systems Architecture Sensor Models (OSM) and other models/tools and maintenance of digital and Hardware in the Loop (HWIL) representations of the tactical versions of AN/TPY-2, Sea Based X-Band Radar (SBX), Upgraded Early Warning Radar (UEWR), and COBRA DANE Upgrade (CDU). This project also supports wargames, Warfighter exercises and training, and execution of element-level ground test campaigns to anchor M&S. Specific and/or unique accomplishments to each FY are as follows:</p> <p><i>FY 2016 Accomplishments:</i> -Completed updates to the Objective Simulation Framework (OSF)-E interfaces allowing for future events utilizing the OSF-E test architecture</p> <p><i>FY 2017 Plans:</i> -Complete development of replacement RF scene generator for AN/TPY-2, Sea Based X-Band Radar (SBX), Upgraded Early Warning Radars (UEWR), and Cobra Dane</p> <p><i>FY 2018 Plans:</i></p>	31.138 -	26.456 -	24.092 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

-Decrease reflects completion of maintenance and support to the AN/TPY-2 digital M&S representation

Title: Capability Development Program	62.705	70.527	96.919
Articles:	-	-	-

Description: The Capability Development Program provides engineering support to enable compliance with BMD System Specification threat capabilities and to address advanced threats prevalent in 2016 and beyond. This task includes the redesign of select components to address obsolescence and to improve reliability of the system. This task initiates electronic protection and objective debris mitigation development efforts to reduce or eliminate the effect of corporate clutter and electronic attack on sensors. It initiates studies to assess Gallium Nitride (GaN) next generation Transmit/Receive module technology and transition the AN/TPY-2 production line from Gallium arsenide (GaAs) components to GaN components. It develops, designs and tests sensor Mid-Term discrimination improvements for X-Band radars, to include Sea-based X-band radar (SBX) threat discrimination improvements. It also performs object classification performance updates to UEWR radars. This effort funds participation in far-term discrimination improvement threat model specifications and develops discrimination and countermeasure mitigation capability development. Additional software development activities include support to THAAD Launch on Remote (LoR) capability and X86 performance optimization to enhance processing speed. Specific and/or unique accomplishments to each FY are as follows:

FY 2016 Accomplishments:

- Completed development and testing of the AN/TPY-2 redesigned Antenna Equipment Unit (AEU) T1 transformer
- Completed capability fielding of Sea Based X-Band Radar and AN/TPY-2 Forward Based Near-term discrimination improvements
- Initiated development of AN/TPY-2 common software that aligns US and FMS software configuration

FY 2017 Plans:

- Initiate system design reviews for AN/TPY-2 electronic protection and object debris mitigation improvements for Mid-Term discrimination
- Initiate the concept development and analysis of new discrimination capabilities for a long range BMD sensor that address NORTHCOM and PACOM radar requirements for the defense of Hawaii.
- Continue development of AN/TPY-2 common software that aligns US and FMS software configuration

FY 2018 Plans:

- Increase reflects initiation of contract through the United States Corps of Engineers to procure, install, and test an Integrated Electronic Security System (IESS) at AN/TPY-2 Forward Based Mode (FBM) Site K. Also includes additional development content associated with active sensor bias monitoring and reporting to support BMDS system track capability.
- Complete development and testing of AN/TPY-2 common software that aligns US and FMS software configuration
- Initiate systems engineering effort to develop draft element specifications for potential Atlantic Radar

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
-Initiate development of Post Intercept Assessment (PIA) capability for the Sea Based X-Band Radar (SBX) and Upgraded Early Warning Radars (UEWRs)				
Title: Sensors Directorate Operations				
Articles:		69.525	71.983	65.483
Description: Program Operations provides strategic planning, program integration, cost estimating, contracting, financial management, internal reviews and audits, earned-value management and program assessments for the program office.		-	-	-
FY 2016 Accomplishments: see above				
FY 2017 Plans: see above				
FY 2018 Plans: see above				
Title: Upgrade Clear Early Warning Radar				
Articles:		19.808	15.258	2.034
Description: Upgrade of Clear Early Warning Radar and Cape Cod Early Warning Radar includes adaptation of hardware and software to UEWR infrastructure, support to BMDS communications and architecture work and installation and at site. This project also includes preparation and removal of legacy equipment at each UEWR site. Specific and/or unique accomplishments to each FY are as follows:		-	-	-
FY 2016 Accomplishments: -Completed manufacturing of Upgraded Early Warning Radar (UEWR) Receiver/Exciter -Completed purchase of non-original manufacturer equipment -Completed upgrade of UEWR Huntsville System Test Lab with Clear and Cape Cod capability				
FY 2017 Plans: -SEE ABOVE				
FY 2018 Plans: -Decrease reflects completion of Clear and Cape Cod Early Warning Radar upgrades				
Accomplishments/Planned Programs Subtotals		221.705	219.503	213.532

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0208866C: O&M	422.950	467.275	504.058	-	504.058	495.950	522.599	544.281	574.889	0	3,532.002
• 0208866C: <i>PROCUREMENT</i>	1,489.203	1,139.503	1,178.364	-	1,178.364	1,576.815	1,535.529	1,522.410	1,555.094	0	9,996.918
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603890C: <i>BMD</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
<i>Enabling Programs</i>											
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603898C: <i>Ballistic Missile Defense Joint Warfighter Support</i>	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0604873C: <i>Long Range Discrimination Radar (LRDR)</i>	132.278	173.162	357.659	-	357.659	135.187	52.218	50.843	119.803	Continuing	Continuing
• 0604879C: <i>Ballistic Missile Defense Sensor Test</i>	83.597	83.250	84.239	-	84.239	65.886	76.218	68.231	56.579	Continuing	Continuing
• 13999903: <i>Planning and Design, Defense Wide</i>	0.000	8.233	8.397	-	8.397	8.525	8.822	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Radar Sustainment Contract (RSC) was awarded on 1 Nov 2011 to support the X-Band Family of Radars including the Army Navy/Transportable Radar Surveillance (AN/TPY-2); the Sea Based X-Band (SBX) Radar; and the Ground Based Radar Prototype (GBR-P). The scope of work covered by this acquisition is limited to that effort which Raytheon has previously performed as the X-band radar product developer. The maintenance and development effort includes the following :

1) Software - (a) maintenance of existing software developed to support the Family of X-Band Radars, and (b) development of hardware and software to meet enhanced capabilities and risk reduction measures ((i.e. PAA Phase 2 and 3 development efforts including debris mitigation; enhanced operational environments; and

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

launch on network track, etc.); 2) Models & Simulation - (a) development, maintenance, and verification of high fidelity models, (b) support for wargames and exercises, and (c) support for performance assessment events; 3) Engineering Services - engineering support for deployed radars to facilitate maintenance efforts which may include but are not limited to hardware obsolescence studies, hardware redesign, technology insertion, and refurbishment efforts. The contract is an Indefinite Delivery/ Indefinite Quantity (IDIQ) task order contract.

The BMDS Communications System Complex-Transportable (BCSC-T) Program Plan addresses the design, development, acquisition, testing, integration, activation, and fielding of the BCSC-T. The overall executing agent is the Program Manager - Communications and Transmission Systems (PMDCATS). Lockheed Martin Mission Systems (C2BMC prime contractor) via an Other Transaction Agreement provides on-site support.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Basic Development Program - Ground Based Radar Prototype (GBR-P) Caretaker	MIPR	SMDC : AL	5.839	2.939	Nov 2015	0.000		0.000		-		0.000	0	8.778	0
Basic Development Program - Information Assurance AN/TPY-2	SS/CPFF	Raytheon : MA	10.549	4.873	Nov 2015	4.708	Nov 2016	3.722	Nov 2017	-		3.722	Continuing	Continuing	Continuing
Basic Development Program - Information Assurance SBX	SS/CPFF	Raytheon : MA	0.441	0.211	Oct 2015	0.221	Oct 2016	0.223	Oct 2017	-		0.223	Continuing	Continuing	Continuing
Basic Development Program - Material Release Get Well Plan	SS/CPFF	Raytheon : MA	9.075	3.745	Dec 2015	4.796	Dec 2016	2.045	Dec 2017	-		2.045	Continuing	Continuing	Continuing
Basic Development Program - Sys Integration & Tech Assessments	SS/CPFF	Raytheon : MA/AL	12.313	4.907	Mar 2016	4.581	Mar 2017	3.273	Mar 2018	-		3.273	Continuing	Continuing	Continuing
Basic Development Program - X-Band Software Enhancements/ Development	SS/CPFF	Raytheon : AL	53.769	21.854	Jan 2016	20.973	Jan 2017	15.741	Jan 2018	-		15.741	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) - M&S Development	SS/CPFF	Raytheon, Northrup Grumman : MA, CO	93.948	22.604	Dec 2015	19.525	Nov 2016	17.058	Nov 2017	-		17.058	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) - VV&A of Models	MIPR	AMRDEC : AL	34.986	6.402	Dec 2015	4.971	Dec 2016	5.037	Dec 2017	-		5.037	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) - Warfighter Exercises	SS/CPFF	Raytheon : MA	6.209	2.132	Feb 2016	1.960	Feb 2017	1.997	Feb 2018	-		1.997	Continuing	Continuing	Continuing
Capability Development Program - AN/TPY-2 GaN TTP	SS/CPAF	Raytheon : MA	0.000	4.878	Apr 2016	0.000		10.200	Jan 2018	-		10.200	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Capability Development Program - Advanced Technology Discrimination	SS/CPAF	Raytheon : MA	5.860	5.919	Dec 2015	16.475	Dec 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Capability Development Program - Atlantic Radar Study	MIPR	TBD : TBD	0.000	0.000		0.000		5.000	Dec 2017	-		5.000	Continuing	Continuing	Continuing
Capability Development Program - Electronic Protection	SS/CPAF	Raytheon, GTRI : MA, GA	0.000	4.625		12.889	Oct 2016	7.659	Oct 2017	-		7.659	Continuing	Continuing	Continuing
Capability Development Program - Enhanced Defense of Hawaii Radar (EDHR) Studies and Analysis	MIPR	JHU/APL, NSWC, MDA : MD, AL, VA	0.000	0.000		3.000	Jan 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Capability Development Program - Enhanced Discrimination	C/CPAF	USAF, Raytheon : Hanscom AFB MA	62.927	10.830	Jan 2016	6.203	Jan 2017	21.900	Nov 2017	-		21.900	Continuing	Continuing	Continuing
Capability Development Program - Integrated Electronic Security System (IESS) Site K	MIPR	US Corps of Engineers : Germany	0.000	0.000		0.000		6.820	Jan 2018	-		6.820	Continuing	Continuing	Continuing
Capability Development Program - Post Intercept Assessment (PIA)	C/TBD	TBD : TBD	0.000	0.000		0.000		10.400	Jan 2018	-		10.400	Continuing	Continuing	Continuing
Capability Development Program - Prior year Capability Development no longer funded in the FYDP	Various	Various : Various	10.974	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Capability Development Program - Program AN/TPY-2 Capability Development	SS/CPAF	Raytheon : MA	48.065	36.453	Oct 2015	31.960	Oct 2016	34.940	Oct 2017	-		34.940	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Sensors Directorate Operations - Army Hybrid Program Office	MIPR	SMDC : AL	3.048	1.670	Dec 2015	1.741	Dec 2016	1.865	Dec 2017	-		1.865	Continuing	Continuing	Continuing
Sensors Directorate Operations - Govt Salaries, Travel, Training (MDA Sensors)	Various	MDA : AL, VA, MA	110.721	22.107	Oct 2015	23.198	Oct 2016	22.026	Oct 2017	-		22.026	Continuing	Continuing	Continuing
Sensors Directorate Operations - MiDAESS, FFRDC/UARC	SS/CPAF	CSS, APL, LL, OGA : AL/MA/VA/MD	214.022	38.396	Jan 2016	38.884	Jan 2017	32.431	Nov 2017	-		32.431	Continuing	Continuing	Continuing
Sensors Directorate Operations - Network and Infrastructure Services	SS/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	25.368	5.531	Feb 2016	4.872	Feb 2017	6.205	Feb 2018	-		6.205	Continuing	Continuing	Continuing
Sensors Directorate Operations - Other Govt Agencies	MIPR	SMDC/AL, Hanscom AFB : MA	27.725	1.821	Feb 2016	3.288	Feb 2017	2.956	Feb 2018	-		2.956	Continuing	Continuing	Continuing
Upgrade Clear Early Warning Radar - BCN Upgrades	MIPR	MDA C2BMC / DISA : MA, AK	17.374	0.929	Jun 2016	0.330	Jun 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Upgrade Clear Early Warning Radar - Facilities Site Activation/Admin Comms	MIPR	MDA C2BMC : MA, AK	3.947	2.305	Nov 2015	1.197	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Upgrade Clear Early Warning Radar - GMD Fire Control Integration	SS/CPAF	Boeing/AK/AL, Raytheon : MA	5.354	0.173	Dec 2015	0.383	Dec 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Upgrade Clear Early Warning Radar - Prior year Upgrade Clear Early Warning Radar no longer funded in the FYDP	Various	Various : Various	3.603	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Upgrade Clear Early Warning Radar - Radar	C/CPAF	Raytheon : MA	92.815	16.192	Jan 2016	13.348	Jan 2017	2.034	Jan 2018	-		2.034	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Upgrade -- Prime Contractor															
Upgrade Clear Early Warning Radar - UEWR System Test Lab Upgrades	SS/CPAF	Raytheon : MA/AL	5.406	0.209	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			864.338	221.705		219.503		213.532		-		213.532	-	-	-

Remarks
Note: Clear Early Warning Upgrade Program includes upgrade of the Cape Cod EWR.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
Operations and sustainment of Upgraded Early Warning Radar (UEWR), COBRA DANE (CD), and Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2) Radars Contract Logistics Support (CLS) are Operations and Maintenance (O&M) Defense-Wide appropriations and are described in the Missile Defense Agency (MDA) O-Documents.

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	864.338	221.705	219.503	213.532	-	213.532	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
(EX) Vigilant Shield/Global Thunder 16	▲													
SNG-C-H-1	◆													
(EX) Host Nation 16	◆	◆												
SNG-S-D-1	◆	◆	◆											
(EX) Steadfast Alliance 16		◆	◆											
SNG-A-H-1		◆	◆	◆	◆									
(WG) Demonstration, Table-top Exercises & Experiments 16			◆	◆	◆									
SNG-U-D-1				◆	◆	◆								
SNG-C-D-1				◆	◆	◆								
SNG C-H-2					◇	◇								
SNG-U-HL-2					◇	◇								
SNG-S-H-1					◇	◇	◇	◇						
SNG-S-D-2					◇	◇								
SNG-A-HL-1					◇	◇								
SNG-A-D-1					◇	◇	◇	◇						
SNG-U-H-1					◇	◇	◇	◇						
(WG) Nimble Titan Year 2 18						◇	◇	◇	◇					
(EX) Air and Missile Defense Exercise Series 18								△						
SNG-C-D-2								◇	◇					
(EX) Host Nation 18								◇	◇					
(EX) Global Lightning 18								◇	◇					
SND-A-H-2								◇	◇					
SNG-U-D-2								◇	◇					
SNG-S-H-2								◇	◇					

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022		
(EX) European Air & Missile Defense Exercise Alliance 17								△													
(EX) Key Resolve 18								△													
(EX) European Test Bed 18								△													
(EX) Global Response Exercise (GREx) 18								◇	◇												
(EX) Steadfast Alliance 18								◇	◇												
SNG-C-H-3								◇	◇	◇											
SNG-S-D-3								◇	◇												
(WG) Demonstration, Table-top Exercises & Experiments 18								◇	◇	◇											
(WG) BMDS Wargames 19								◇	◇	◇	◇	◇									
SNG-A-H-3										◇	◇										
(EX) Fleet Synthetic Training-Joint 19											△										
(EX) European Test Bed 19											△										
SNG-A-D-2											◇	◇									
(EX) Joint Project Optic Windwill 2019											◇	◇									
(EX) Steadfast Armour 19											◇	◇									
(EX) Austere Challenge 19											◇	◇	◇	◇	◇	◇					
(WG) Huntsville Wargames 19												△									
SNG-C-H-4											◇	◇									
(EX) KEEN Sword 19											◇	◇	◇								
(EX) KEEN Edge 20											◇	◇	◇	◇							
(EX) Vigilant Shield 20											◇	◇									
SNG-S-H-3											◇	◇									
(EX) Global Thunder 20											◇	◇									
(WG) Nimble Titan Year 2 20											◇	◇	◇	◇							

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

	Significant Event Complete ▲ Significant Event Planned △		Milestone Decision Complete ★ Milestone Decision Planned ☆		Element Test Complete ◆ Element Test Planned ◇		System Level Test Complete ● System Level Test Planned ○		Complete Activity ◆ Planned Activity ◇	
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022			
(EX) Air and Missile Defense Exercise Series 20					△					
SNG-U-H-2					◇	◇				
(EX) Global Lightning 20					◇	◇				
SNG-U-D-3					◇	◇				
(EX) European Air & Missile Defense Exercise Alliance 19					△					
(EX) Fleet Synthetic Training-Joint 20					△					
(EX) Global Response Exercise (GREx) 19					△					
(EX) Key Resolve 20					△					
(EX) European Test Bed 20					△					
(EX) Steadfast Alliance 20					◇	◇				
(EX) Host Nation 20					△					
SNG-S-D-4					◇	◇				
(EX) KEEN Sword 21					◇	◇	◇	◇		
(EX) KEEN Sword 23					◇	◇	◇	◇		
(WG) BMDS Wargames 21					◇	◇	◇	◇	◇	
(EX) Global Lightning 21							◇	◇		
SNG-A-H-4							◇	◇		
(EX) Global Lightning 22							◇	◇		
(EX) European Air & Missile Defense Exercise Alliance 20									△	
(EX) Eagle Resolve 21									△	
(EX) Fleet Synthetic Training-Joint 21									△	
(EX) Key Resolve 21									△	
(EX) European Test Bed 21									△	
SNG-A-D-3									◇	◇

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
(EX) Joint Project Optic Windwill 2021											◇	◇		
(EX) Steadfast Armour 21											◇	◇		
(EX) Austere Challenge 21											◇	◇	◇	◇
(WG) Huntsville Wargames 21											△			
SNG-C-H-5											◇	◇		
SNG-S-H-4												◇	◇	
(EX) Global Thunder 22												◇	◇	
(EX) Vigilant Shield 22												◇	◇	
(EX) Air and Missile Defense Exercise Series 22														△
SNG-U-D-4													◇	◇
SNG-U-H-3													◇	◇
(EX) European Air & Missile Defense Exercise Alliance 21														△
(EX) European Test Bed 22														△
(EX) Fleet Synthetic Training-Joint 22														△
(EX) Steadfast Alliance 22													◇	◇
(EX) Host Nation 22														◇
SNG-S-D-5														◇
(WG) BMDS Wargames 23														◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) Vigilant Shield/Global Thunder 16	1	2016	1	2016
SNG-C-H-1	1	2016	1	2016
(EX) Host Nation 16	1	2016	2	2016
SNG-S-D-1	1	2016	3	2016
(EX) Steadfast Alliance 16	2	2016	3	2016
SNG-A-H-1	2	2016	1	2017
(WG) Demonstration, Table-top Exercises & Experiments 16	3	2016	1	2017
SNG-U-D-1	4	2016	2	2017
SNG-C-D-1	4	2016	2	2017
SNG C-H-2	1	2017	2	2017
SNG-U-HL-2	1	2017	2	2017
SNG-S-H-1	1	2017	4	2017
SNG-S-D-2	2	2017	3	2017
SNG-A-HL-1	2	2017	3	2017
SNG-A-D-1	2	2017	1	2018
SNG-U-H-1	3	2017	2	2018
(WG) Nimble Titan Year 2 18	4	2017	3	2018
(EX) Air and Missile Defense Exercise Series 18	1	2018	1	2018
SNG-C-D-2	1	2018	2	2018
(EX) Host Nation 18	1	2018	2	2018
(EX) Global Lightning 18	1	2018	2	2018
SND-A-H-2	1	2018	2	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
SNG-U-D-2	1	2018	2	2018
SNG-S-H-2	1	2018	2	2018
(EX) European Air & Missile Defense Exercise Alliance 17	2	2018	2	2018
(EX) Key Resolve 18	2	2018	2	2018
(EX) European Test Bed 18	2	2018	2	2018
(EX) Global Response Exercise (GREx) 18	2	2018	3	2018
(EX) Steadfast Alliance 18	2	2018	3	2018
SNG-C-H-3	2	2018	4	2018
SNG-S-D-3	3	2018	4	2018
(WG) Demonstration, Table-top Exercises & Experiments 18	3	2018	1	2019
(WG) BMDS Wargames 19	3	2018	3	2019
SNG-A-H-3	1	2019	2	2019
(EX) Fleet Synthetic Training-Joint 19	2	2019	2	2019
(EX) European Test Bed 19	2	2019	2	2019
SNG-A-D-2	2	2019	3	2019
(EX) Joint Project Optic Windwill 2019	2	2019	3	2019
(EX) Steadfast Armour 19	2	2019	3	2019
(EX) Austere Challenge 19	2	2019	3	2020
(WG) Huntsville Wargames 19	3	2019	3	2019
SNG-C-H-4	3	2019	4	2019
(EX) KEEN Sword 19	3	2019	1	2020
(EX) KEEN Edge 20	3	2019	2	2020
(EX) Vigilant Shield 20	4	2019	1	2020
SNG-S-H-3	4	2019	1	2020
(EX) Global Thunder 20	4	2019	1	2020

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
(WG) Nimble Titan Year 2 20	4	2019	3	2020
(EX) Air and Missile Defense Exercise Series 20	1	2020	1	2020
SNG-U-H-2	1	2020	2	2020
(EX) Global Lightning 20	1	2020	2	2020
SNG-U-D-3	1	2020	2	2020
(EX) European Air & Missile Defense Exercise Alliance 19	2	2020	2	2020
(EX) Fleet Synthetic Training-Joint 20	2	2020	2	2020
(EX) Global Response Exercise (GREx) 19	2	2020	2	2020
(EX) Key Resolve 20	2	2020	2	2020
(EX) European Test Bed 20	2	2020	2	2020
(EX) Steadfast Alliance 20	2	2020	3	2020
(EX) Host Nation 20	3	2020	3	2020
SNG-S-D-4	3	2020	4	2020
(EX) KEEN Sword 21	3	2020	2	2021
(EX) KEEN Sword 23	3	2020	2	2021
(WG) BMDS Wargames 21	3	2020	3	2021
(EX) Global Lightning 21	1	2021	2	2021
SNG-A-H-4	1	2021	2	2021
(EX) Global Lightning 22	1	2021	2	2021
(EX) European Air & Missile Defense Exercise Alliance 20	2	2021	2	2021
(EX) Eagle Resolve 21	2	2021	2	2021
(EX) Fleet Synthetic Training-Joint 21	2	2021	2	2021
(EX) Key Resolve 21	2	2021	2	2021
(EX) European Test Bed 21	2	2021	2	2021
SNG-A-D-3	2	2021	3	2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD11 / <i>BMDS Radars</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) Joint Project Optic Windwill 2021	2	2021	3	2021
(EX) Steadfast Armour 21	2	2021	3	2021
(EX) Austere Challenge 21	2	2021	3	2022
(WG) Huntsville Wargames 21	3	2021	3	2021
SNG-C-H-5	3	2021	4	2021
SNG-S-H-4	4	2021	1	2022
(EX) Global Thunder 22	4	2021	1	2022
(EX) Vigilant Shield 22	4	2021	1	2022
(EX) Air and Missile Defense Exercise Series 22	1	2022	1	2022
SNG-U-D-4	1	2022	2	2022
SNG-U-H-3	1	2022	2	2022
(EX) European Air & Missile Defense Exercise Alliance 21	2	2022	2	2022
(EX) European Test Bed 22	2	2022	2	2022
(EX) Fleet Synthetic Training-Joint 22	2	2022	2	2022
(EX) Steadfast Alliance 22	2	2022	3	2022
(EX) Host Nation 22	3	2022	3	2022
SNG-S-D-5	3	2022	4	2022
(WG) BMDS Wargames 23	3	2022	3	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD41 / <i>Pacific Radar</i>
--	--	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD41: <i>Pacific Radar</i>	-	0.000	0.000	21.000	-	21.000	25.800	99.000	83.300	216.060	0	445.160
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Beginning in FY 2018 funding is requested to establish the Pacific Radar Program Element (MD41).

A. Mission Description and Budget Item Justification

The Pacific Radar program includes systems engineering and requirements development, software development, design reviews, testing, and Models and Simulation (M&S) efforts for radar development. This program prepares site infrastructure for construction activities and, when complete, executes site activation. Pacific Radar functionality includes integration with C2BMC systems support. Activities also include development and delivery of the initial radar software release and the establishment of the independent verification and validation (IV&V) lab to test the operational software. The Pacific Radar program includes purchasing, manufacturing, and testing long lead radar components.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Pacific Radar	0.000	0.000	21.000
Articles:	-	-	-
Description: This effort funds the initial planning, design and development of the Pacific Radar. Specific and/or unique accomplishments to each FY are as follows:			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: -Complete environmental, geotechnical, and other studies for environmental compliance and inform military construction (MILCON) design efforts -Initiate prime contract award and developmental engineering for radar hardware, software and equipment shelter -Initiate preparation for the Pacific Radar System Requirements Review (SRR) -Initiate preparation of the Pacific Radar Integrated Baseline Review (IBR)			
Accomplishments/Planned Programs Subtotals	0.000	0.000	21.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD41 / <i>Pacific Radar</i>
--	--	---

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>SENSORS MILCON</i>	0.000	166.670	0.000	-	0.000	150.000	0.000	212.000	0.000	0	528.670
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 31299903: <i>MILCON PLANNING and DESIGN</i>	15.000	0.000	0.000	-	0.000	15.184	36.140	16.248	8.009	0	90.581

Remarks

D. Acquisition Strategy

The Pacific Radar acquisition strategy is in development by the Missile Defense Agency (MDA).

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD41 / <i>Pacific Radar</i>
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Pacific Radar - Prime Contractor	TBD	TBD : TBD	0.000	0.000		0.000		18.000	Jun 2018	-		18.000	Continuing	Continuing	Continuing
Pacific Radar - Program Office	Various	TBD : TBD	0.000	0.000		0.000		3.000	Jun 2018	-		3.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		21.000		-		21.000	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	21.000	-	21.000	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency							Date: May 2017									
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>				Project (Number/Name) MD41 / <i>Pacific Radar</i>								
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇							
				FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022						
Pacific Radar Development						◆◆	◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD41 / <i>Pacific Radar</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Pacific Radar Development	3	2018	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>				Project (Number/Name) MC11 / <i>Cyber Operations</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC11: <i>Cyber Operations</i>	2.675	1.196	1.045	3.636	-	3.636	1.089	8.950	4.410	1.156	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The funds in this project will be utilized to complete transitioning to and the sustainment of the new DoDI 8510.01 Risk Management Framework (RMF) for DoD Information Technology (IT) requirement for the MDA Sensors Directorate and conduct Security Control Assessments (SCA) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information System Security Manager (PM/ISSM) Plans of Action and Milestones for MDA Sensors mission systems. It also includes support for external cybersecurity assessments and penetration testing of the Sensors mission systems, both in laboratory-based Enterprise Cyber Range Experiments and in ground test activities, in accordance with the Director, Operational Test and Evaluation (DOT&E) directive. It maintains the Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, Cybersecurity Risk Assessment results, cybersecurity scorecard, and Authorizing Official (AO) authorization decisions) and POA&Ms for all MDA information systems.

This project supports the monitoring, prioritization, and tracking of Cybersecurity mitigations detailed in Information Technology security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior Information Assurance Officer (SIAO)/Security Control Assessor (SCA) and Authorizing Official (AO). Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network / System Certification and Accreditation (C&A)	1.196	1.045	3.636
Articles:	-	-	-
Description: Cyber Operations funds Sensors Directorate Information System Security Manager (ISSM) civilian salaries and cybersecurity engineering and architecture planning for program information technology systems. This project plans and tests the cybersecurity controls for the BMDS and maintains Sensors DoD Information Assurance Certification and Accreditation Process (DIACAP) certification and accreditation packages. Effort also funds transitioning to the new Risk Management Framework (RMF) accreditation paradigm for Sensors-managed information systems, conducts Controls Validation Testing (CVT) / Security Controls Assessment (SCA) of Sensors mission and support systems and provides and maintains Plans of Action and Milestones to mitigate cybersecurity deficiencies. Cyber Operations conducts annual cybersecurity program reviews on the Sensors enclaves to assess compliance in implementing and maintaining controls. Specific and/or unique accomplishments to each FY are as follows:			
FY 2016 Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MC11 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
SEE ABOVE			
FY 2017 Plans: SEE ABOVE			
FY 2018 Plans: -In addition to above, initiate of cybersecurity supply chain compliance			
Accomplishments/Planned Programs Subtotals	1.196	1.045	3.636

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603898C: <i>Ballistic Missile Defense Joint Warfighter Support</i>	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0604873C: <i>Long Range Discrimination Radar (LRDR)</i>	132.278	173.162	357.659	-	357.659	135.187	52.218	50.843	119.803	Continuing	Continuing
• 0604879C: <i>Ballistic Missile Defense Sensor Test</i>	83.597	83.250	84.239	-	84.239	65.886	76.218	68.231	56.579	Continuing	Continuing
• 0901598C: <i>Management HQ - MDA</i>	35.871	31.160	29.947	-	29.947	28.024	27.269	27.878	28.450	Continuing	Continuing
• 13999903: <i>Planning and Design, Defense Wide</i>	0.000	8.233	8.397	-	8.397	8.525	8.822	0.000	0.000	Continuing	Continuing

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MC11 / <i>Cyber Operations</i>

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MC11 / <i>Cyber Operations</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services (Booz Allen)	C/CPFF	Booz Allen Hamilton : AL, CO, VA	1.297	0.721	Nov 2015	0.492	Nov 2016	0.538	Nov 2017	-		0.538	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services (Torch Technologies)	C/CPFF	Torch Technologies : AL, CO, VA	1.020	0.280	Jan 2016	0.388	Jan 2017	0.353	Jan 2018	-		0.353	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Civilian Salaries	Various	MDA : AL, CO, VA	0.358	0.195	Oct 2015	0.165	Oct 2016	0.176	Oct 2017	-		0.176	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Cybersecurity Supply Chain Compliance	SS/CPAF	Raytheon : MA	0.000	0.000		0.000		2.569	Mar 2018	-		2.569	Continuing	Continuing	Continuing
Subtotal			2.675	1.196		1.045		3.636		-		3.636	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.675	1.196	1.045	3.636	-	3.636	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MC11 / <i>Cyber Operations</i>
--	--	--

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	Transition to Cyber Security Risk Management Framework (CRMF)	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Information Assurance Certification and Accreditation (C&A) Package Preparation / Submission	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Cyber Security Program Policy / Risk Management	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Cyber Security Mitigation Monitoring and Tracking	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
BMDS Cyber Security Policy Development	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MC11 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Transition to Cyber Security Risk Management Framework (CRMF)	1	2016	4	2022
Information Assurance Certification and Accreditation (C&A) Package Preparation / Submission	1	2016	4	2022
Cyber Security Program Policy / Risk Management	1	2016	4	2022
Cyber Security Mitigation Monitoring and Tracking	1	2016	4	2022
BMDS Cyber Security Policy Development	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	65.873	10.119	9.529	9.177	-	9.177	9.397	13.639	13.705	19.867	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016 and FY 2017, Program Wide Support reflects proportional changes as a result of decreases to the Ballistic Missile Defense Sensors program element. FY 2018 reflects proportional changes as a result of increases to the Ballistic Missile Defense Sensors. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts and Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	10.119	9.529	9.177
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	10.119	9.529	9.177

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	5.985	2.037		0.192	Jul 2017	0.184	Jul 2018	-		0.184	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations User Services	MIPR	Various : Multi: AL, CO, NM, VA, Various	8.251	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPRs)	MIPR	Various : Multi:AL,VA	11.077	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (Reqn)	Reqn	Department of Labor : Washington, DC	0.063	0.107		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CO, CA, VA	34.792	7.425	Jan 2016	9.086	Aug 2017	8.641	Aug 2018	-		8.641	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support civilian Salaries, Travel, Training	Allot	MDA : Multi:AK, AL,CA, CO, VA	3.388	0.550	Nov 2015	0.251	Nov 2016	0.352	Nov 2017	-		0.352	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support, International, and Materiel and Readiness	C/CPAF	JRDC : JRDC	0.587	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	Allot	Various : Multi: AL, CO, CA, VA	1.730	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			65.873	10.119		9.529		9.177		-		9.177	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency							Date: May 2017						
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>						
	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	65.873	10.119		9.529		9.177		-		9.177	-	-	-

Remarks

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆					
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇					
			FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
MD40 Program-Wide Support			◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / <i>Ballistic Missile Defense Sensors</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1,296.311	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
MD24: System Engineering & Integration	494.423	146.148	139.866	150.358	-	150.358	151.837	157.982	156.943	156.690	Continuing	Continuing
MT23: Enabling - Test	18.225	16.043	17.749	22.767	-	22.767	20.811	20.735	22.008	21.751	Continuing	Continuing
MD28: Intelligence & Security	107.954	39.085	41.254	44.708	-	44.708	44.557	47.744	48.732	49.477	Continuing	Continuing
MD30: BMD Information Management Systems	234.332	90.685	92.628	84.499	-	84.499	81.337	89.036	91.592	95.019	Continuing	Continuing
MC30: Cyber Operations	31.503	27.194	22.881	41.458	-	41.458	45.070	56.616	73.479	56.086	Continuing	Continuing
MD31: Modeling & Simulation	125.432	39.972	44.458	49.824	-	49.824	63.465	97.374	140.616	51.374	Continuing	Continuing
MC31: Engineering Cyber Operations	0.204	0.613	0.253	3.838	-	3.838	6.500	13.308	34.988	13.448	Continuing	Continuing
MD32: Quality, Safety, and Mission Assurance	177.382	28.864	31.022	30.516	-	30.516	29.796	31.387	31.901	32.550	Continuing	Continuing
MD40: Program-Wide Support	106.856	17.722	18.483	21.474	-	21.474	23.387	26.227	29.605	25.520	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note
N/A

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense System (BMDS) Enabling Programs provide critical products and processes needed to combine element missile defense systems into a single, integrated and layered BMDS to provide new defensive capabilities and evaluate existing capabilities against the emerging threats. Specifically, the Enabling Programs:

- Define BMDS architectures and functional requirements, conduct Analyses of Alternatives (AoA) for the DoD, and provide engineering requirements, execution support, and pre- and post-mission analysis for BMD System tests
- Provide validated models and simulations for BMD System assessment
- Assess BMDS performance and deliver capabilities to the Warfighter
- Provide multi-disciplinary security and intelligence support for BMDS acquisition, development, test, and deployment
- Identify potential threats and vulnerabilities to MDA and the BMDS and develop and implement strategies to mitigate those risks
- Assess architecture alternatives to address advanced threats and provide recommendations for future BMDS configurations to keep pace with evolving threats

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>
---	--

- Provide Information Management tools and products supporting the development of BMDS capabilities while safeguarding networks and critical program information
- Provide MDA secure communication networks, IT systems, special purpose processing nodes, operations and monitoring centers, and disaster recovery and continuity of operations requirements
- Evaluate quality, technical safeguards, and mission assurance effectiveness
- Assess System ability to maintain integrity and superiority with advances in technology development

This Program Element includes BMDS threat discrimination improvements, which will enhance BMDS effectiveness against the evolving adversary threat. The end result will be a BMDS architecture more capable of discriminating and destroying reentry vehicles with a higher degree of confidence, improving Warfighter shot doctrine, and more efficiently using interceptor inventory. BMDS threat discrimination improvements are funded from the Enabling (0603890C), Midcourse (0603882C), BMD Sensors (0603884C), BMD Command, Control, Battle Management and Communications (C2BMC) (0603896C), and Aegis BMD (0603892C) PEs.

This effort also investigates concepts and explores system engineering issues associated with innovative space applications for missile defense intercept and defeat system.

FY 2017 Amended Budget Request Justification: \$+7.000M is required to address Joint Emergent Operational Need and emergency warfighting readiness requirements to ensure readiness of the BMDS.

+\$6.700 million project MD24 to begin NDAA-directed efforts to develop a Hypersonic Threat Defense program. Efforts include 180-day study, plume and hardbody signature data for threat analyses, an accelerated Analysis of Alternatives, leveraging DoD-level resources to augment promising technology analysis, and participation in a target of opportunity mission to obtain sensor data. This is a Joint Emergent Operational Need requirement.

+\$0.300 million project MT23 to provide additional M&S support for BMDS ground test planning and execution to ensure readiness of the BMDS.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	404.780	401.594	404.993	-	404.993
Current President's Budget	406.326	408.594	449.442	-	449.442
Total Adjustments	1.546	7.000	44.449	-	44.449
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	9.994	0.000			
• SBIR/STTR Transfer	-8.448	0.000			
• Other Adjustment	0.000	7.000	44.449	-	44.449

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>
---	--

Change Summary Explanation

The increase in FY2018 from PB17 to PB18 supports emerging Department of Defense priorities, including:

- Aegis Ashore Defense (\$10.000 million)
- M&S improvements (\$5.320 million)
- Discrimination Improvements and Countermeasures Mitigation (\$3.172 million)

FY 2017 Amended Budget Request Justification: \$+7.000M is required to address Joint Emergent Operational Need and emergency warfighting readiness requirements to ensure readiness of the BMDS.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD24: System Engineering & Integration	494.423	146.148	139.866	150.358	-	150.358	151.837	157.982	156.943	156.690	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

- In FY 2018, \$10.585 million of IT funding was realigned from MD24 into MC30 for Cybersecurity priority efforts.
- In FY 2018, \$10.000 million was added to MD24 for Aegis Ashore Defense.
- In FY 2018, consolidated \$4.343 million of IT funding from MD24 to MD30 for more efficient execution.
- In FY 2018, \$6.900 million was added to MD24 for Post Intercept Assessment.

A. Mission Description and Budget Item Justification

The System Engineering & Integration (SE&I) workforce, including Industry and Contractor Support Services (CSS), defines, designs, tests and integrates the BMDS, and provides analysis, decision support and planning activities for real-world operations to the National Command Authority, Joint Staff, Military Services, Combatant Commanders, Operational Test Agencies, Director of Operational Test and Evaluation, Allies, and others.

The SE&I Major Program Goals are:

- Plan, design, develop, integrate, and test a layered BMDS that provides the required BMD performance
- Provide system-level engineering support to the BMDS Elements, and lead collaborative cross-Element, cross-Component engineering
- Lead the engineering required to achieve Enhanced Homeland Defense capability
- Develop architectures and requirements to respond to the proliferation of short and medium range ballistic missiles
- Provide a more effective missile defense capability for U.S. deployed forces, allies, and partners, and enhance homeland defense
- Develop discrimination improvements for the Homeland and Regional Defense missions
- As technical authority for Integrated Air and Missile Defense (IAMD), provide a consistent, disciplined systems engineering process using a multi-Service team to integrate Joint IAMD systems
- Provide technical direction to Element and Component developers and provide System-level forums to track, assess, and improve hardware and software reliability
- Identify BMDS capabilities and limitations
- Develop performance assessment requirements, verify BMDS performance through testing, and conduct assessments to form the basis for technical capability declarations in support of fielding decisions
- Identify Critical Engagement Conditions and data required to develop the test campaigns to demonstrate BMDS performance
- Define the test objectives necessary to anchor BMDS-level models and simulations, enable independent verification and validation
- Identify System issues occurring in ground and flight tests and lead the effort to resolve them
- Analyze architecture alternatives and new technologies to establish technical roadmaps for future capabilities
- Ensure the BMDS is complementary to and interoperable with NATO and other theater systems
- Develop anti-tamper approaches to enable international fielding of the BMDS

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

The BMDS discrimination improvements effort will develop and field integrated Element capabilities to improve the BMDS ability to identify lethal and non-lethal objects. SE&I will conduct BMDS performance analysis and engineering to specify the BMDS requirements and interfaces to achieve the improved capability.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Title: Requirements and Design</p> <p style="text-align: right;">Articles:</p> <p>Description: The Requirements and Design effort develops the BMD System level requirements and specifications for the Phased Adaptive Approach (PAA) Phases and beyond, and drives the integration of the BMDS. Requirements and Design allocates requirements to BMDS Elements and adjudicates Element level specifications to provide required capabilities for the Warfighter.</p> <ul style="list-style-type: none"> - Define BMDS technical content expectations and develop system requirements. - Develop and allocate functional performance, interface, and design suitability requirements to Programs, in collaboration with BMDS element engineers. - Deliver system technical baseline updates to document integrated system build content as identified in the R4 summary. - Identify and resolve technical disconnects through the requirements trace process and element certifications; conduct engineering analyses and perform trade studies. - Participate in Element Requirements Reviews. - Develop Specification Change Notices (SCN) for future requirements changes, to include mitigation strategies to address BMDS Discrepancy Reports. - Ensure reporting of Element functionality and software / hardware integration in the BMDS Accountability Report (BAR) and Director's Program Reviews. - Assess and add emerging threats to MDA's lethality prediction models. - Incorporate updates to lethality assessments, collateral effects, and consequences of intercept into the BMDS Lethality Program Plan. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). - Developed Specification Change Notices for post- PAA Phase 3 requirements changes, to include mitigation strategies to address BMDS Discrepancy Reports. - Delivered requirements language for Mid Term discrimination improvement capabilities to executing elements, in collaboration with BMDS Program Elements. - Refined Redesigned Exoatmospheric Kill Vehicle (RKV) and Long Range Discrimination Radar (LRDR) requirements for BMDS 2020 Homeland Defense. 	28.871	29.100	34.118
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<ul style="list-style-type: none"> - Completed BMDS 2020 System Requirements Review (SRR) for enhanced homeland defense, to include the RKV, LRDR, and Mid-term discrimination improvements. 			
---	--	--	--

FY 2017 Plans:

- Conduct activities listed in Description section (SEE ABOVE).
- Define BMDS technical content expectations and develop system requirements, to include integration of new capabilities, such as the Navy's Air and Missile Defense Radar (SPY-6).
- Develop initial requirements for Far-term BMD content to pace the evolving threat.
- Deliver requirements for Far-Term discrimination improvements.

FY 2018 Plans:

FY 2018 increase is due to requirements and design work required to incorporate Post Intercept Assessment (PIA) into the BMDS.

- Conduct activities listed in Description section (SEE ABOVE).
- Define BMDS technical content expectations and develop system requirements, to include integration of new capabilities, such as Overhead Persistent Infrared (OPIR) interfaces and improved regional sensor discrimination
- Develop requirements for Additional Protection Techniques.
- Conduct initial experimentation for Post Intercept Assessment (PIA).
- Refine approach to implement and assess BMD System Track capability.
- Assure the successful integration of evolving DoD Position, Navigation, and Timing services into the BMDS.

Title: Integrated Air and Missile Defense (IAMD)	15.200	15.989	16.911
Articles:	-	-	-

Description: The IAMD effort provides a consistent, disciplined systems engineering process using a joint service systems engineering team to develop the technical requirements necessary to support integration of joint service IAMD systems, implementing capabilities required by the Geographic Combatant Commands. This effort includes systems engineering analysis, development of technical and interface control requirements and documents, definition of candidate Joint IAMD increments, and configuration control across the joint systems. The initial work will provide improved performance such as an improved air picture to enable engagement coordination decision making, increase battlespace, and improve track continuity. Follow-on increments will address critical joint Command and Control and interoperability needs such as integrated fire control.

FY 2016 Accomplishments:

- Continued analysis of technical options for improving the air picture to support coordinated decision making in a joint warfighting environment.
- Supported Joint Integrated Air and Missile Defense Organization (JIAMDO) in completing the IAMD Increment 1 Operational Benefits Assessment

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>-- Assessed options and conducted Alternative Systems Review to select technical option(s) for the first Joint IAMD capability increment (improved air picture)</p> <p>-- Expanded the IAMD M&S capabilities developed in FY 2014 and FY 2015 to support derivation of more detailed Joint Track Management Control (JTMC) requirements and evaluate performance of the selected technical approach for achieving the Joint Requirements Oversight Council (JROC) approved JTMC operational requirements to include the capability to support advanced engagement coordination across the air domain.</p> <p>-- Developed the IAMD increment 1 joint system architecture which is consistent with the JROC approved IAMD operational architecture.</p> <p>-- Defined engineering tasks for IAMD Increment 2 capability.</p> <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Maintain and deliver updates to an IAMD system of systems level requirements specification, documenting the technical requirements for allocation to the affected air defense programs of record. - Conduct Joint IAMD System Requirements Reviews with affected service systems to incorporate IAMD Increment 1 capability. - Execute the joint system engineering tasks for IAMD Increment 2 capability. - Expand IAMD M&S capabilities to support derivation of more detailed JTMC requirements for Increment 1 capability and to support IAMD Increment 2 concept development defined in FY 2016 to address critical joint Command and Control and interoperability needs. - Develop an IAMD joint system architecture for IAMD Increment 2 capability that is consistent with the JROC approved IAMD operational architecture. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Update IAMD M&S capabilities to support requirements development for the option(s) selected at the improved air picture Alternative System Review - Continue to conduct additional systems engineering and prototyping to address issues uncovered for IAMD Increment 1 -- Conduct Joint IAMD System Requirements Reviews with the affected service systems to incorporate IAMD Increment 1 capability - Improve upon the IAMD joint system architecture description by incorporating IAMD Increment 2 capabilities such as Combat Identification and/or planning capabilities as appropriate - Continue to conduct long-range planning for future capability increments 			
<p>Title: System-Level Verification and Assessment</p> <p align="right">Articles:</p> <p>Description: This activity funds BMD System Assessment and Verification, Validation, and Accreditation (VV&A) activities to support BMDS Operational Capacity Baseline (OCB) delivery decisions and Technical Capability Declarations (TCDs), and anchor System modeling & simulation.</p>	14.686	15.196	18.462
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Develop and manage assessment plans and requirements for BMDS capability increments: -- Map assessment requirements to data collection venues (i.e., ground tests, flight tests, and exercises). -- Evaluate current Modeling & Simulation (M&S) capability to address assessment requirements, and provide recommendations for new or improved M&S. - Maintain assessment documentation per the R4 summary. - Conduct extensive analysis of data collected in BMDS ground and flight test events, instrumental to understanding BMDS interoperability and performance, and anchoring models and simulations. - Identify mitigation approaches for system performance issues uncovered during the course of analysis and assessment. - Monitor development and recommend improvements to the simulation enterprise based on an evaluation of the validity of Component, Element and System-level models (and frameworks) and participation in assessment activities and Modeling and Simulation events. - Conduct assessments of BMD System capabilities and limitations prior to capability delivery decisions. - Produce independent assessments of each incremental BMDS Capability Delivery to support fielding readiness determinations. - Verify BMDS performance against specified requirements, and produce BMDS verification status reports. - Maintain M&S VV&A database and toolkit. - Maintain verification data for BMD System Specification Change Notices. - Recommend solutions to improve assessment confidence, including M&S and testing issue resolutions. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). - Conducted system assessment in support of European Phased Adaptive Approach (EPAA) Phase 2 TCD - Assessed BMDS Element hardware and software for OCB decision: Aegis BMD Baseline 9.B1/C1, AN/TPY-2 CX 2.1.0, Fort Drum IDT, PATRIOT 7.2 - Implemented Warfighter Integrated Master Assessment Plan (IMAP) Synchronization Team (WIST) to support CCMD assessment planning and requirements development - Developed assessment plan for EPAA Phase 3 TCD - Developed assessment plans and requirements for BMDS Enhanced Homeland Defense - Developed BMDS 2020 System Assessment Strategy - Assisted Director, Operational Test & Evaluation (DOT&E) in developing achievable way forward to implement the 2015 BMDS OTA Accreditation Plan. - Accredited the following M&S: <ul style="list-style-type: none"> -- WILMA Raid Simulation Scenario Execution Suite. -- Version 15.1 Sea-Based X-Band, Cobra Dane, AN/TPY-2 Forward Based Mode, and Upgraded Early Warning Radar Models for Radar Discrimination/ Classification. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-- BMDS M&S used in the Ground Test Integrated - 06 (GTI-06) Part 2 Test Event.</p> <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). - Assess BMDS Enhanced Homeland Defense performance for TCD. - Develop assessment plans and requirements for EPAA Phase 3 and Robust Intermediate Range Ballistic Missile (IRBM) Defense. <p>FY 2018 Plans:</p> <p>FY 2018 increase is based on additional work required to implement Operational Test Agency (OTA) Accreditation Plan.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). - Conduct system assessment in support of BMDS EPAA Phase 3 TCD. - Develop assessment plans and requirements for BMDS 2020 Homeland Defense and Mid-term Discrimination Improvements. - Implement the BMDS OTA Accreditation Plan by generating additional VV&A evidence to meet M&S accreditation requirements for ground tests in support of BMDS TCDs and Operational Acceptance. 				
<p>Title: Knowledge Centers</p> <p>Description: Title: Knowledge Centers Description: Knowledge Centers serve as independent technical advisors to BMDS program offices in the C2BMC, Interceptor, Space, and Sensor areas to support development of technical approaches and improve reliability.</p> <ul style="list-style-type: none"> - Provide Federally Funded Research and Development Centers (FFRDC) and University Affiliated Research Centers (UARC) subject matter expertise, to include reach-back capability as needed, for Element program managers: -- Provide Subject Matter Expertise and analytical support for Independent Review Teams, mission assurance assessments, Failure Review Boards and Failure Investigation Teams -- Identify and provide recommendations to mitigate technical risks, including innovative and unconventional approaches -- Promote knowledge sharing between external technical sources and MDA. - Perform independent technical assessments of critical BMDS and Element program issues: -- Define element knowledge points (KPs), establish closure criteria, and provide closure recommendations -- Continue to provide BMD System and Element performance assessments. - Conduct assessments of emerging technologies as required. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). 		<p>Articles:</p> <p>14.252</p> <p>-</p>	<p>14.142</p> <p>-</p>	<p>15.469</p> <p>-</p>

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017
<ul style="list-style-type: none"> - Supported Knowledge Point definition for new programs, including LRDR and RKV. <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). 			
<p>Title: Future Concepts and Planning</p> <p align="right">Articles:</p> <p>Description: This activity funds BMDS architecture and future concept development, and efforts and studies to address the BMDS emergent threat, including DoD Analyses of Alternatives (AoA).</p> <ul style="list-style-type: none"> - Perform BMDS capability gap analysis, and analyze and document architecture alternatives and/or new technologies to address gaps - Develop Initial Requirements Documents (IRDs) to establish functional, performance and integration planning requirements for next generation BMD weapons and sensors - Identify architecture alternatives that improve BMDS performance and are complementary to and interoperable with North Atlantic Treaty Organization (NATO) systems and theaters around the world - Conduct technology development reviews for future/follow-on BMDS Element development efforts. - Update concept capability documentation based on architectural options, trade studies, and technology development experiments. - Maintain and update Phased Implementation Plan to document integrated requirements for improvements to, or augmentations of, current system capabilities. - Develop Preliminary Specification Change Notices for selected future BMDS capabilities and technologies. - Maintain a dialog with the warfighter community for all BMDS engineering and technical issues -- Inform Warfighter development of the Prioritized Capabilities List (PCL) by providing relevant BMD System data -- Develop yearly update to the Achievable Capabilities List (ACL) per the R4 summary. - Lead collaborative effort to improve foreign partners' understanding of existing system capabilities, architectural performance and operational concepts of the BMDS <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). - Completed BMDS inputs to Office of the Secretary of Defense (OSD) Cost Assessment and Program Evaluation's (CAPE) Homeland and Regional Missile Defense Mission Sensor AoA, to analyze alternatives for future MDA and DoD BMDS Sensor architectures - Conducted analyses of architecture alternatives, including: 		17.585	19.186
		-	-
		-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<ul style="list-style-type: none"> -- Space-Based Interceptor concepts and potential space sensor architectures -- Directed energy concepts -- Electro-Optical/Infrared sensors -- Architectures to counter the evolving threat - Provided Missile Defense systems engineering expertise to support OSD initiatives, such as Advanced Threat Missile Defeat (ATMD) part 1 and Gun-Based Defense <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). - Participate in designated OSD activities or analyses, as directed by Congress - Conduct analyses of architecture alternatives, including: <ul style="list-style-type: none"> -- Sensor options for Enhanced Defense of Hawaii -- Other advanced sensor concepts -- Potential space layer technologies -- Rail Gun concepts - Conduct systems engineering as part of NDAA-directed Hypersonic Defense program: <ul style="list-style-type: none"> -- Conduct architecture studies and initiate Analyses of Alternatives (AoA) to include required M&S modifications -- Define and develop M&S tools to support analysis activities -- Define and produce threat data to support architecture analyses efforts -- Collaborate across DoD to leverage expertise and on-going activities <p>FY 2018 Plans:</p> <p>FY 2018 decrease reflects transfer of Hypersonic Defense activities to Project MD29, Hypersonic Defense, in PE 0604181C.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). - Participate in designated OSD activities or analyses, as directed by Congress - Conduct analyses of architecture alternatives, including: <ul style="list-style-type: none"> -- Space sensor technologies -- Boost phase concepts 			
---	--	--	--

Title: Systems Engineering, Engineering Analysis and Quick Response Team	9.504	9.865	10.620
Articles:	-	-	-

Description: This task provides rapid response, high quality systems engineering analysis products and supporting technical data to address external and internal Agency inquiries and decisions:

- Conduct system level analyses to support ongoing BMDS Architecture and Systems Engineering efforts.
- Analyze expected performance of BMDS Architecture options:
 - Analyze and predict the performance of future BMDS capabilities

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> -- Provide technical assessments, and collaborate with BMDS Elements to define and track technical performance measures. - Respond to Warfighter, Combatant Command (CCMD) and Congressional requests for information and analysis (RFIs/RFAs) - Provide analytical support for real-world events. - Maintain analysis parameters database and standards per the R4 summary to ensure consistency. - Develop analytical data to respond to information requests from MDA and DoD leadership. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). - Continued performance analysis to support the development of Homeland Defense system architecture development and employment options. - Conducted system level performance analyses for ongoing BMDS Architecture and Systems Engineering efforts, including: <ul style="list-style-type: none"> -- BMD System performance analysis in support of the Global Sensor Analysis of Alternatives -- Achievable Capabilities List for 2016 -- Spaced Based Interceptor Study -- Advanced Threat Missile Defense Study Part 1 -- Siting studies for Terminal High Altitude Area Defense (THAAD) in South Korea, the Long Range Discrimination Radar, the Pacific Radar, and an Atlantic Radar -- Support for Pre-SCN development of requirements for the Pacific Radar -- Congressional Studies for Defense of Hawaii, Defense of the East Coast <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). - Analyze expected performance of options for Enhanced Homeland Defense and Regional system architectures, including: <ul style="list-style-type: none"> -- BMD System performance analysis in support of the Advanced Threat Missile Defense Study Part 2 -- Analysis of Railgun -- Analysis of advanced sensor and weapon concepts against advanced threats. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). 			
<p>Title: Discrimination</p> <p align="right">Articles:</p> <p>Description: For Mid-term and Far-term discrimination, SE&I will establish performance goals for the technology development phase; develop functional, performance, and interface requirements to address the Mid-term and Far-term threat sets. SE&I will establish ground and flight test requirements for the Mid-term and Far-term phases, and generate threat data to support analysis and testing activities.</p>	28.955	18.754	12.774
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

FY 2016 Accomplishments:

- Completed integration phase for Near-Term ground testing via GTI-06
- Monitored Near-term ground testing via GTI-06 and GTD-06 and analyzed test results
- Assessed Near-Term capability readiness for fielding
- Supported Element Mid-Term discrimination improvement requirements definition in support of Element design refinement
- Completed system testing environment Objective Simulation Framework updates for Mid-term capabilities
- Assisted in development of data collection requirements for of Mid-Term capability flight tests
- Defined & developed Far-term threat models for engineering analysis, requirements development, capabilities development, and test and verification
- Planned, managed, and conducted trades and analysis tasks across the elements for Far-term discrimination improvements and countermeasures mitigation technology application to the Far-term threat

FY 2017 Plans:
FY 2017 decrease reflects completion of Near-term discrimination improvements testing and assessment activities, and completion of the Mid-term discrimination improvement requirements definition and performance specification development activities.

- Complete Mid-term discrimination improvements systems engineering work and integrate element level design solutions
- Complete analysis to support test planning and assessment of the integrated capability
- Perform cross element and system level integration of Mid-term discrimination improvements design solutions.
- Conduct Far-term discrimination and countermeasure mitigation capability development
- Define Far-term decision logic improvement solutions which are mature enough to initiate preliminary design
- Develop definition of fire control/weapon handover improvements and initiate preliminary design
- Execute system requirements review for radar electronic protection improvements.

FY 2018 Plans:
FY 2018 decrease is in-line with efforts to transition focus from top-level systems engineering to element engineering.

- Identify and address Mid-term discrimination integration issues and work resolution with BMDS Elements in preparation for 2021 Technical Capability Declaration.
- Support modifications to Mid-term discrimination content in the integrated master assessment plan and integrated master test plan.
- Develop detailed plan to support Mid-term discrimination Technical Capability Declaration.

Title: Risk Management	7.272	7.619	8.145
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Description: The Risk Management task identifies BMDS element and component technical risks, and tracks status and risk mitigation progress.</p> <ul style="list-style-type: none"> - Convene and chair Risk Management Working Group. - Execute the risk management and mission readiness working group process. - Maintain a risk database using the Failure Reporting and Corrective Action System. - Review and approve program element risks, on quarterly basis. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). 			
<p>Title: Anti-Tamper & Engineering Manufacturing Readiness Level Development</p> <p align="right">Articles:</p> <p>Description: This task develops anti-tamper approaches to inhibit reverse engineering of critical technologies, and oversees the use of Engineering and Manufacturing Readiness Levels (EMRLs) to assess BMDS element, component, or system maturity.</p> <ul style="list-style-type: none"> - Develop anti-tamper approaches to enable international fielding, support coalition warfare, and extend the effective operational life of the BMDS. - Engage and support the Services in understanding and transitioning BMDS Element Anti-Tamper activities. - Participate in Element reviews to assess proposed Anti-Tamper solutions and assist programs in developing and implementing Anti-Tamper detection and response technologies to mitigate risk. - Monitor application of EMRLs to evaluate engineering and manufacturing maturity of BMDS elements, systems, and components. - Assess and report readiness of MDA development efforts for transition to production. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2018 Plans:</p>	5.382 -	5.353 -	5.795 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

- Conduct activities listed in Description section (SEE ABOVE).

<p>Title: Manufacturing and Producibility</p> <p align="right">Articles:</p> <p>Description: This activity supports a system-level manufacturing and producibility team to address materials, key component, and subsystem design and development to reduce cycle time, part count, and risk. This activity also supports a system-level reliability team to reduce risk of test failures and performance shortcomings and drive reliability into system and component designs.</p> <ul style="list-style-type: none"> - Assess BMDS industrial base and determine critical manufacturing technologies -- Conduct assessments of critical component supply base and update critical technologies database -- Collaborate with national security space components on investment strategies for critical technologies -- Develop engineering management tool to characterize industrial base risks. - Utilize supply chain risk identification and mitigation tracking system to mitigate manufacturing supply issues for critical components - Assess the effectiveness of reliability programs for each MDA Product (Radar, Launcher, Missile/Interceptor, etc.) to achieve/sustain required reliability. - Perform reliability, composite risk, and probability of mission success assessments for flight tests. - Identify failure trends/modes and evaluate impact on the Probability of Mission Success; evaluate potential corrective actions -- Provide element/program scorecard data to support reliability evaluations/assessments. - With Logistics Support, develop MDA Reliability and Logistic Policies/Plans to promote an integrated Sustainability efforts - Ensure that BMDS products have achieved the required maturity in Reliability, Availability, and Maintainability (RAM) to support the transition from MDA to the appropriate service organization; provide RAM expertise as needed to Element Program Offices. - Provide updates to MDA RAM policy and guidance. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). 	4.441	4.662	4.944
	-	-	-

<p>Title: Aegis Ashore Defense</p> <p align="right">Articles:</p>	0.000	0.000	10.000
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Description: Consistent with direction in Public Law 114-92, National Defense Authorization Act for FY 2016, the Department is required to provide defense of Aegis Ashore sites in Romania and Poland by mid-year 2019. This effort will build upon a previously-conducted study that assessed potential options to fulfill this requirement.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Demonstrate a viable, organic capability for Aegis Ashore sites in Romania and Poland in accordance with the NDAA. -- Conduct testing, analysis and assessment utilizing the land-based test facility at White Sands Missile Range (WSMR). -- Partner with MDA Functional and Navy/Army Program Offices to conduct two demonstrations at WSMR in FY18. - Develop and implement an architecture, and prove a target track provided by an Army sensor can effectively provide enough track data to allow the Aegis Combat System (ACS) to develop an engagement order. - Integrate Navy's Sea Rolling Airframe Missile (SeaRAM) with the ACS to characterize architecture and functionality. - Conduct a live missile test to prove missile performance over land. 			
Accomplishments/Planned Programs Subtotals	146.148	139.866	150.358

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603881C: Ballistic Missile	197.617	209.072	230.162	-	230.162	194.328	253.778	264.377	267.254	Continuing	Continuing
<i>Defense Terminal Defense Segment</i>											
• 0603882C: Ballistic Missile Defense Midcourse Defense Segment	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: Ballistic Missile Defense Sensors	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603892C: AEGIS BMD	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603896C: Ballistic Missile Defense Command and Control, Battle Management & Communication	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing

Remarks

D. Acquisition Strategy

In order to optimize the performance of the BMDS, MDA leverages the nation's engineering Centers of Excellence at government agencies and Military Services, FFRDCs, UARCs, and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution to the BMDS. Products and Services will be acquired by competitive means to the extent that is possible and practical.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Requirements and Design - Reqs & Design - Lethality Spt - FFRDC/UARC	MIPR	SNL : CA	0.684	0.357	Oct 2015	0.364	Nov 2016	1.046	Nov 2017	-		1.046	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - Lethality Spt - CSS	C/CPAF	Corvid : NC	0.715	0.744	Nov 2015	0.758	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - CSS 1	C/CPFF	MiDAESS / TEAMS : AL	30.638	3.509	Oct 2015	1.886	Nov 2016	3.654	Nov 2017	-		3.654	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - CSS 3	C/CPFF	MEI : AL	0.600	0.281	Oct 2015	0.286	Nov 2016	0.509	Nov 2017	-		0.509	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - FFRDC/UARC 1	MIPR	ORNL : TN	0.984	0.000		0.000		0.391	Nov 2017	-		0.391	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - FFRDC/UARC 2	MIPR	MITRE : VA	0.000	0.555	Oct 2015	0.762	Nov 2016	2.074	Nov 2017	-		2.074	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - HAENS Spt	MIPR	NSWC Crane : IN	0.514	0.460	Oct 2015	0.469	Nov 2016	0.479	Nov 2017	-		0.479	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	0.000		1.300	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - Industry	C/CPAF	Boeing : AL	86.218	11.128	Oct 2015	9.486	Nov 2016	8.077	Nov 2017	-		8.077	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements and Design - Reqs & Design - MDA	Allot	MDA : AL, VA	25.071	9.699	Nov 2015	11.917	Oct 2016	8.800	Oct 2017	-		8.800	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - OGA	MIPR	AMRDEC : AL	3.449	2.138	Oct 2015	1.872	Nov 2016	2.188	Nov 2017	-		2.188	Continuing	Continuing	Continuing
Requirements and Design - Reqs & Design - Post Intercept Assessment	Various	Various : Various	0.000	0.000		0.000		6.900	Dec 2017	-		6.900	Continuing	Continuing	Continuing
Integrated Air and Missile Defense (IAMD) - IAMD - FFRDC	Various	Various : AL, VA, MD	1.037	1.510	Nov 2015	0.000		0.000		-		0.000	0	2.547	0
Integrated Air and Missile Defense (IAMD) - IAMD - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	0.000		0.670	Nov 2016	0.000		-		0.000	0	0.670	0
Integrated Air and Missile Defense (IAMD) - IAMD - OGA	MIPR	AMRDEC : AL	0.000	0.000		4.319	Nov 2016	4.448	Nov 2017	-		4.448	Continuing	Continuing	Continuing
Integrated Air and Missile Defense (IAMD) - IAMD - Support	C/CPFF	MiDAESS / TEAMS : AL, VA, CO	1.109	2.282	Nov 2015	0.499	Nov 2016	1.498	Nov 2017	-		1.498	Continuing	Continuing	Continuing
Integrated Air and Missile Defense (IAMD) - IAMD - Various	MIPR	DoD Activities : Various	10.750	11.408	Nov 2015	10.501	Nov 2016	10.965	Nov 2017	-		10.965	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - CSS	C/CPFF	MiDAESS / TEAMS : AL	3.941	1.424	Nov 2015	1.044	Nov 2016	3.368	Nov 2017	-		3.368	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - CSS 2	C/CPFF	MiDAESS / TEAMS : AL, CO	0.000	0.000		2.046	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 1	MIPR	Aerospace : CA	15.296	1.495	Oct 2015	1.433	Nov 2016	1.700	Nov 2017	-		1.700	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 2	MIPR	JHU/APL : MD, VA	9.102	0.894	Oct 2015	0.962	Nov 2016	1.100	Nov 2017	-		1.100	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 6	MIPR	MIT/LL : MA	16.666	1.860	Oct 2015	1.372	Nov 2016	1.400	Nov 2017	-		1.400	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 7	MIPR	MITRE : VA	14.342	2.225	Oct 2015	1.599	Nov 2016	1.618	Nov 2017	-		1.618	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	0.993	Oct 2015	1.200	Nov 2016	0.000		-		0.000	0	2.193	0
System-Level Verification and Assessment - Sys V&A - M&S Accreditation	Various	Various : Various	0.000	0.000		0.000		2.000	Nov 2017	-		2.000	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - MDA	Allot	MDA : VA, AL	6.102	0.547	Oct 2015	0.619	Oct 2016	2.389	Oct 2017	-		2.389	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - OGA	MIPR	AMRDEC : AL	6.698	2.130	Oct 2015	1.043	Nov 2016	1.369	Oct 2017	-		1.369	Continuing	Continuing	Continuing
System-Level Verification and Assessment - V&A Industry Support	C/CPFF	Boeing : AL	6.986	3.118	Oct 2015	3.878	Nov 2016	3.518	Nov 2017	-		3.518	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 1	MIPR	Aerospace : CA	10.026	1.438	Oct 2015	1.716	Nov 2016	1.793	Nov 2017	-		1.793	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 2	MIPR	MIT/LL : MA	5.564	1.453	Oct 2015	0.983	Nov 2016	1.027	Nov 2017	-		1.027	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 3	FFRDC	MITRE : VA	5.702	1.366	Oct 2015	0.998	Nov 2016	1.042	Nov 2017	-		1.042	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 4	FFRDC	JHU/APL : VA	5.401	1.077	Oct 2015	0.657	Nov 2016	0.820	Nov 2017	-		0.820	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 7	MIPR	GTRI : GA	3.939	0.000		0.347	Nov 2016	0.363	Nov 2017	-		0.363	Continuing	Continuing	Continuing
Knowledge Centers - KC - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.432	0.900	Oct 2015	1.700	Nov 2016	0.000		-		0.000	0	3.032	0

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Knowledge Centers - KC - MDA	Various	MDA : AL, VA	17.608	6.443	Oct 2015	6.125	Nov 2016	5.099	Oct 2017	-		5.099	Continuing	Continuing	Continuing
Knowledge Centers - KC - TEAMS	C/CPFF	MiDAESS / TEAMS : AL	0.000	0.000		0.000		3.276	Nov 2017	-		3.276	Continuing	Continuing	Continuing
Knowledge Centers - KC - Various	MIPR	Various : Various	2.448	1.575	Oct 2015	1.616	Nov 2016	2.049	Nov 2017	-		2.049	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - Architecture CSS	C/CPFF	MiDAESS / TEAMS : AL	3.621	2.994	Oct 2015	3.371	Nov 2016	3.740	Nov 2017	-		3.740	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - Architecture Support	Various	Various : VA, AL	2.897	3.510	Oct 2015	1.109	Nov 2016	1.780	Oct 2017	-		1.780	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - CSS	C/CPFF	MiDAESS / TEAMS : AL	20.428	1.106	Oct 2015	1.498	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - FFRDC / UARC 1	MIPR	SNL : CA	2.105	0.577	Oct 2015	0.385	Nov 2016	0.391	Nov 2017	-		0.391	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - FFRDC / UARC 3	MIPR	MIT/LL : MA	0.999	2.532	Oct 2015	0.385	Nov 2016	0.783	Nov 2017	-		0.783	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - FFRDC / UARC 4	MIPR	JHU/APL : MD, VA	3.698	0.755	Oct 2015	0.790	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - FFRDC / UARC 5	MIPR	MITRE : VA	1.595	0.387	Oct 2015	0.462	Nov 2016	0.478	Nov 2017	-		0.478	Continuing	Continuing	Continuing
Future Concepts and Planning - Future	MIPR	Aerospace : CA	1.885	0.453	Oct 2015	0.385	Nov 2016	0.391	Nov 2017	-		0.391	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Concepts - FFRDC / UARC 6															
Future Concepts and Planning - Future Concepts - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	0.000		0.450	Nov 2016	0.000		-		0.000	0	0.450	0
Future Concepts and Planning - Future Concepts - Industry	C/CPAF	Boeing : AL	25.989	2.567	Oct 2015	1.078	Nov 2016	2.000	Nov 2017	-		2.000	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - Support	Allot	MDA : VA / AL	4.768	2.704	Oct 2015	2.573	Oct 2016	3.557	Oct 2017	-		3.557	Continuing	Continuing	Continuing
Future Concepts and Planning - Hypersonic Defense - CSS	C/CPFF	MiDAESS / TEAMS : AL, VA	0.000	0.000		0.800	Apr 2017	0.000		-		0.000	0	0.800	0
Future Concepts and Planning - Hypersonic Defense - FFRDC	Various	Various : AL, NM, MA, VA	0.000	0.000		2.017	Apr 2017	0.000		-		0.000	0	2.017	0
Future Concepts and Planning - Hypersonic Defense - Industry	C/CPAF	Boeing : AL	0.000	0.000		1.000	Apr 2017	0.000		-		0.000	0	1.000	0
Future Concepts and Planning - Hypersonic Defense - UARC	MIPR	JHU / APL : MD, VA	0.000	0.000		1.413	Apr 2017	0.000		-		0.000	0	1.413	0
Future Concepts and Planning - Hypersonic Defense - Various	Various	Various : Various	0.000	0.000		1.470	Apr 2017	0.000		-		0.000	0	1.470	0
Systems Engineering, Engineering Analysis and Quick Response Team - Sys Engrg, QRT - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.232	0.793	Oct 2015	0.270	Nov 2016	0.000		-		0.000	0	1.295	0
Systems Engineering, Engineering Analysis and Quick Response Team - Sys Engrg, QRT - CSS	C/CPFF	MiDAESS / TEAMS : AL	26.770	4.590	Oct 2015	4.682	Nov 2016	2.421	Nov 2017	-		2.421	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering, Engineering Analysis and Quick Response Team - Sys Engrg, QRT - CSS 2	C/CPFF	SAIC : VA, AL	9.666	4.121	Oct 2015	4.556	Nov 2016	7.650	Nov 2017	-		7.650	Continuing	Continuing	Continuing
Systems Engineering, Engineering Analysis and Quick Response Team - Sys Engrg, QRT - MDA	Various	MDA : VA, AL	2.912	0.000		0.357	Nov 2016	0.549	Oct 2017	-		0.549	Continuing	Continuing	Continuing
Discrimination - Discrimination - CSS	C/CPFF	MiDAESS / TEAMS : AL	7.878	4.860	Nov 2015	1.998	Nov 2016	2.489		-		2.489	Continuing	Continuing	Continuing
Discrimination - Discrimination - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	0.000		2.006	Nov 2016	0.000		-		0.000	0	2.006	0
Discrimination - Discrimination - Industry	C/CPAF	Boeing : AL, VA	8.567	11.005	Nov 2015	2.000	Nov 2016	3.172	Nov 2017	-		3.172	Continuing	Continuing	Continuing
Discrimination - Discrimination - Support	Allot	MDA : AL, VA	7.357	9.658	Nov 2015	8.400	Oct 2016	3.337	Oct 2017	-		3.337	Continuing	Continuing	Continuing
Discrimination - Discrimination - Various	Various	Various : AL, VA	6.419	3.432	Nov 2015	4.350	Nov 2016	3.776	Nov 2017	-		3.776	Continuing	Continuing	Continuing
Discrimination - Prior year Discrimination Improvements no longer funded in FYDP	Various	Various : Various	25.213	0.000		0.000		0.000		-		0.000	0	25.213	0
Risk Management - Risk Mgt - Analysis	Various	MDA : VA, AL	7.493	5.238	Oct 2015	5.892	Oct 2016	6.824	Oct 2017	-		6.824	Continuing	Continuing	Continuing
Risk Management - Risk Mgt - Analysis Spt	C/CPAF	MiDAESS / TEAMS : AL	1.849	0.864	Nov 2015	0.250	Nov 2016	0.733	Nov 2017	-		0.733	Continuing	Continuing	Continuing
Risk Management - Risk Mgt - FFRDC/UARC	MIPR	MITRE : VA	3.870	0.377	Oct 2015	0.577	Nov 2016	0.588	Nov 2017	-		0.588	Continuing	Continuing	Continuing
Risk Management - Risk Mgt - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.432	0.793	Oct 2015	0.900	Nov 2016	0.000		-		0.000	0	2.125	0
Anti-Tamper & Engineering Manufacturing Readiness Level Development - AT	MIPR	NSWC Crane : IN	6.059	0.209	Nov 2015	0.213	Nov 2016	0.498	Nov 2017	-		0.498	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
& EMRL - Anti-Tamper Support															
Anti-Tamper & Engineering Manufacturing Readiness Level Development - AT & EMRL - MDA	Allot	MDA : AL, VA	11.139	4.859	Oct 2015	4.927	Oct 2016	5.297	Oct 2017	-		5.297	Continuing	Continuing	Continuing
Anti-Tamper & Engineering Manufacturing Readiness Level Development - OGA Support	MIPR	AMRDEC : AL	0.455	0.314	Nov 2015	0.213	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Anti-Tamper & Engineering Manufacturing Readiness Level Development - Prior year AT & EMRL no longer funded in FYDP	Various	Various : Various	2.001	0.000		0.000		0.000		-		0.000	0	2.001	0
Manufacturing and Producibility - Core Standards	C/CPFF	Boeing : AL	1.109	1.091	Nov 2015	1.113	Nov 2016	1.500	Nov 2017	-		1.500	Continuing	Continuing	Continuing
Manufacturing and Producibility - Mfg and Producibility	Allot	MDA : AL	1.287	0.645	Oct 2015	0.491	Oct 2016	1.475	Oct 2017	-		1.475	Continuing	Continuing	Continuing
Manufacturing and Producibility - Mfg and Producibility - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	0.500		0.950	Nov 2016	0.000		-		0.000	0	1.450	0
Manufacturing and Producibility - Mfg and Producibility - OGA Support	MIPR	AMRDEC : AL	3.708	2.205	Nov 2015	2.108	Nov 2016	1.969	Nov 2017	-		1.969	Continuing	Continuing	Continuing
Aegis Ashore Defense - Concept Dev	Various	Various : Various	0.000	0.000		0.000		10.000	Nov 2017	-		10.000	Continuing	Continuing	Continuing
Subtotal			494.423	146.148		139.866		150.358		-		150.358	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	494.423	146.148		139.866		150.358		-		150.358	-	-	-

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇	
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022			
Update to Integrated Master Assessment Plan (IMAP) - 1Q FY 2016	▲									
Ballistic Missile Defense System Specification (BMD SS)	▲									
Element Design Reviews - FY 2016	▲									
System Engineering Plan (SEP) Update - FY 2016	▲									
Ballistic Missile Defense System (BMDS) Requirements Review	▲									
Ballistic Missile Defense System Description Document (BMD SDD)	▲									
Ballistic Missile Defense System Engineering Review - FY 2016		▲								
Ballistic Missile Defense System Interface Control Documents (SICD) Part I - FY 2016		▲								
Update Master Integration Plan (MIP) - FY 2016		▲								
BMD SS - FY 2016		▲								
Element/Component Characterization for Analysis (E/CCA) - 4Q - FY 2016			▲							
Provide Independent Assessments to MDA - FY 2016			▲							
Technical Objectives & Goals / Effectiveness Metrics Standard Updates - FY 2016			▲							
Update to BMD SDD - FY 2017				△						
Update to IMAP - 1Q FY 2017				△						
BMD SS - FY 2017				△						
Element Design Reviews - FY 2017				△						
Ballistic Missile Defense System Engineering Review - FY 2017					△					
Update to IMAP - 3Q FY 2017					△					
Update Achievable Capabilities List - FY 2017					△					
Element/Component Characterization for Analysis (E/CCA) - 4Q - FY 2017						△				
Provide Independent Assessments to MDA - FY 2017						△				
Update MIP - FY 2017						△				
Update to BMD SDD - FY 2018							△			

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇	
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022			
Update to IMAP - 1Q FY 2018			△							
Element Design Reviews - FY 2018			△							
BMD SS - FY 2018			△							
BMD SER - FY 2018			△							
Update Achievable Capabilities List - FY 2018			△							
Update to IMAP - 3Q FY 2018			△							
E/CCA - 4Q - FY 2018				△						
Technical Objectives & Goals / Effectiveness Metrics Standard Updates - FY 2018				△						
Update MIP - FY 2018				△						
Update to IMAP - 1Q FY 2019								△		
Update to BMD SDD - FY 2019								△		
Deliver Assessment for EPAA Phase 3 – FY 2019								△		
BMD SS - FY 2019									△	
Element Design Reviews - FY 2019									△	
SEP Update - FY 2019									△	
Update to IMAP - 3Q FY 2019									△	
BMD SER - FY 2019									△	
Update Achievable Capabilities List - FY 2019									△	
Update MIP - FY 2019									△	
E/CCA 4Q - FY 2019									△	
Update to IMAP - 1Q FY 2020										△
Update to BMD SDD - FY 2020										△
SEP Update - FY 2020										△
BMD SS - FY 2020										△

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
BMD SER - FY 2020										△				
Update to IMAP - 3Q FY 2020										△				
Update MIP - FY 2020											△			
E/CCA - 4Q - FY 2020											△			
Update to BMD SDD - FY 2021												△		
SEP Update FY 2021													△	
BMD SS - FY 2021													△	
BMD SER - FY 2021														△
Update to IMAP - 3Q FY 2021														△
Update Achievable Capabilities List - FY 2022														△
Update MIP - FY 2021														△
E/CCA - 4Q FY 2021														△
Update to BMD SDD - FY 2022														△
SEP Update FY 2022														△
BMD SS - FY 2022														△
Updates to IMAP -3Q FY 2022														△
BMD SER - FY 2022														△
Update MIP - FY2022														△
E/CCA - 4Q FY 2022														△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Update to Integrated Master Assessment Plan (IMAP) - 1Q FY 2016	1	2016	1	2016
Ballistic Missile Defense System Specification (BMD SS)	1	2016	1	2016
Element Design Reviews - FY 2016	2	2016	2	2016
System Engineering Plan (SEP) Update - FY 2016	2	2016	2	2016
Ballistic Missile Defense System (BMDS) Requirements Review	2	2016	2	2016
Ballistic Missile Defense System Description Document (BMD SDD)	2	2016	2	2016
Ballistic Missile Defense System Engineering Review - FY 2016	3	2016	3	2016
Ballistic Missile Defense System Interface Control Documents (SICD) Part I - FY 2016	3	2016	3	2016
Update Master Integration Plan (MIP) - FY 2016	3	2016	3	2016
BMD SS - FY 2016	3	2016	3	2016
Element/Component Characterization for Analysis (E/CCA) - 4Q - FY 2016	4	2016	4	2016
Provide Independent Assessments to MDA - FY 2016	4	2016	4	2016
Technical Objectives & Goals / Effectiveness Metrics Standard Updates - FY 2016	4	2016	4	2016
Update to BMD SDD - FY 2017	1	2017	1	2017
Update to IMAP - 1Q FY 2017	1	2017	1	2017
BMD SS - FY 2017	2	2017	2	2017
Element Design Reviews - FY 2017	2	2017	2	2017
Ballistic Missile Defense System Engineering Review - FY 2017	3	2017	3	2017
Update to IMAP - 3Q FY 2017	3	2017	3	2017
Update Achievable Capabilities List - FY 2017	3	2017	3	2017
Element/Component Characterization for Analysis (E/CCA) - 4Q - FY 2017	4	2017	4	2017
Provide Independent Assessments to MDA - FY 2017	4	2017	4	2017
Update MIP - FY 2017	4	2017	4	2017

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD24 / System Engineering & Integration
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
Update to BMD SDD - FY 2018	1	2018	1	2018
Update to IMAP - 1Q FY 2018	1	2018	1	2018
Element Design Reviews - FY 2018	2	2018	2	2018
BMD SS - FY 2018	2	2018	2	2018
BMD SER - FY 2018	3	2018	3	2018
Update Achievable Capabilities List - FY 2018	3	2018	3	2018
Update to IMAP - 3Q FY 2018	3	2018	3	2018
E/CCA - 4Q - FY 2018	4	2018	4	2018
Technical Objectives & Goals / Effectiveness Metrics Standard Updates - FY 2018	4	2018	4	2018
Update MIP - FY 2018	4	2018	4	2018
Update to IMAP - 1Q FY 2019	1	2019	1	2019
Update to BMD SDD - FY 2019	1	2019	1	2019
Deliver Assessment for EPAA Phase 3 FY 2019	1	2019	1	2019
BMD SS - FY 2019	2	2019	2	2019
Element Design Reviews - FY 2019	2	2019	2	2019
SEP Update - FY 2019	2	2019	2	2019
Update to IMAP - 3Q FY 2019	3	2019	3	2019
BMD SER - FY 2019	3	2019	3	2019
Update Achievable Capabilities List - FY 2019	3	2019	3	2019
Update MIP - FY 2019	4	2019	4	2019
E/CCA 4Q - FY 2019	4	2019	4	2019
Update to IMAP - 1Q FY 2020	1	2020	1	2020
Update to BMD SDD - FY 2020	1	2020	1	2020
SEP Update - FY 2020	2	2020	2	2020
BMD SS - FY 2020	2	2020	2	2020
BMD SER - FY 2020	3	2020	3	2020

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>	Project (Number/Name) MD24 / <i>System Engineering & Integration</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
Update to IMAP - 3Q FY 2020	3	2020	3	2020
Update MIP - FY 2020	4	2020	4	2020
E/CCA - 4Q - FY 2020	4	2020	4	2020
Update to BMD SDD - FY 2021	1	2021	1	2021
SEP Update FY 2021	2	2021	2	2021
BMD SS - FY 2021	2	2021	2	2021
BMD SER - FY 2021	3	2021	3	2021
Update to IMAP - 3Q FY 2021	3	2021	3	2021
Update Achievable Capabilities List - FY 2022	3	2021	3	2021
Update MIP - FY 2021	4	2021	4	2021
E/CCA - 4Q FY 2021	4	2021	4	2021
Update to BMD SDD - FY 2022	1	2022	1	2022
SEP Update FY 2022	2	2022	2	2022
BMD SS - FY 2022	2	2022	2	2022
Updates to IMAP -3Q FY 2022	3	2022	3	2022
BMD SER - FY 2022	3	2022	3	2022
Update MIP - FY2022	4	2022	4	2022
E/CCA - 4Q FY 2022	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs				Project (Number/Name) MT23 / Enabling - Test			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT23: <i>Enabling - Test</i>	18.225	16.043	17.749	22.767	-	22.767	20.811	20.735	22.008	21.751	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 increase keeps pace with projected FY 2018-FY 2022 IMTP events, and reflects System-level test analyses, M&S integration, and supporting validation and assessment activities required for EPAA Phase 3 Technical Capability Declaration (TCD).

A. Mission Description and Budget Item Justification

The Enabling Test project includes the SE&I that drives BMDS test planning, execution, and post-test analysis and assessment, and the M&S tools and framework required to prepare for and execute ground and flight tests.

SE&I allocates test requirements to individual test events, designs test architectures, defines target requirements, and generates ground and flight test scenarios to collect data essential for model validation and system verification. SE&I works with the Service Operational Test Agencies (OTA) to incorporate operational test requirements into BMDS events to ensure the incremental capability being transferred to the Warfighter will be operationally effective, suitable, and survivable. The resulting data ensures BMDS requirements are being met by the system under test and confirms proper BMD System operation. It also helps to anchor system and element M&S for use in simulations to characterize BMDS performance across the battle space, including areas where no live-fire-testing is performed.

Engineering ground test (GT) responsibilities include BMDS performance sensitivity analysis; scenario design and optimization; analysis to mitigate test data collection risks; test architecture certification analysis; and test result analysis. Flight test (FT) responsibilities include pre-mission scenario analysis to identify and mitigate test execution risk in advance; range safety analysis; mission analysis during test execution; extensive post-mission analysis; and event analysis reporting products. These efforts inform senior leaders' decisions on BMDS development and evolution and underpin the BMDS capability declarations that deliver new capabilities to the Warfighter.

Pre-mission predictions use the test framework and Hardware in the Loop (HWIL) and digital models of the test configuration to exercise system interfaces, calculate expected BMDS performance, and gauge readiness for test execution. Post-mission, MDA uses test results to anchor System and element M&S and provide confidence in their ability to correctly predict BMDS behavior and performance.

Reliability, Availability and Maintainability data collected through BMDS test events increases confidence in BMDS performance over the entire lifecycle. SE&I documents any abnormal system behavior observed during tests and alerts MDA to issues with test article reliability. SE&I leads test failure review boards, identifies data collection shortfalls, and reallocates objectives to future test events as needed until all required model validation data is collected. The Failure Reporting, Analysis, and Corrective Action System provides a framework to investigate test failures and anomalies and identify solutions that will ultimately improve BMDS performance and reliability.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MT23 / Enabling - Test
--	---	--

MDA's M&S systems and products provide the BMDS, the Warfighter, and the OTA with the capability to evaluate individual BMDS components and the overall M&S system-of-systems. MDA validates and accredits system-level models and simulations to support accurate and comprehensive assessments of the BMDS. M&S System and product testing follows the test program outlined in MDA's IMTP and serves as a necessary precursor to conducting BMD System-level testing. Resources for the planning, design, execution and management of this testing are provided in accordance with the BMDS Test Policy, as listed in the most current version of the IMTP.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Title: Engineering and Analysis</p> <p align="right">Articles:</p> <p>Description: The Engineering and Analysis effort provides essential BMDS ground and flight test event planning, execution, and evaluation activities for each test event:</p> <ul style="list-style-type: none"> - Designing test architecture, defining test objectives and evaluation criteria, defining target requirements, and generating ground and flight test scenarios appropriate to the data collection requirements to assess BMDS performance and anchor Models and Simulations. - Producing the threat data for BMDS ground and flight tests. - Coordinating with BMDS Operational Test Agency (OTA) to address test issues, disposition them, coordinate them, with the OTA and recommend action plans to achieve closure. - Delivering HWIL M&S integration test cases. - Conducting M&S HWIL Integration Benchmark and integrating the BMDS HWIL M&S framework with MDA and non-MDA Elements into the test event BMDS architecture. - Integrating, testing, functionally qualifying, and delivering end-to-end BMDS simulations supporting ground test missions. - Analyzing System-level interoperability. - Conducting modeling and technical analysis for Combatant Command wargames and exercises. - Utilizing M&S for pre-test assessment and post-test review, as well as M&S updates. - Providing test configuration management; risk assessments; and anomaly/deficiency review, assessment and closure. - Analyzing test results to identify verification and validation data collection shortfalls and reassigning objectives to future test events as required. - Documenting BMDS test observations for system-level test anomalies and coordinating the resulting BMDS Discrepancy Reports within the Failure Reporting, Analysis, and Corrective Action System (FRACAS) - Upgrading test analysis tools in concert with the BMDS evolution (e.g., Modular Analysis and Reporting Suite (MARS)) to enhance analysis capability and efficiency. <p>Specific unique accomplishments per FY are as follows:</p> <p>FY 2016 Accomplishments: see above</p> <p>FY 2017 Plans: FY 2017 increase keeps pace with projected FY 2017-FY 2021 IMTP events.</p>	16.043	17.749	22.767
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MT23 / Enabling - Test

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Validate test event data collection and conduct post-test analyses supporting delivery of Near-term Discrimination Improvements and Enhanced Homeland Defense capabilities. - Participate in target-of-opportunity missions to collect sensor data. FY 2018 Plans: FY 2018 increase keeps pace with projected FY 2018-FY 2022 IMTP events, and reflects System-level test analyses, M&S integration, and supporting validation and assessment activities required for EPAA Phase 3 Technical Capability Declaration (TCD). - Validate test event data collection and conduct post-test analyses supporting the EPAA Phase 3 TCD.			
Accomplishments/Planned Programs Subtotals	16.043	17.749	22.767

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0604878C: <i>Aegis BMD Test</i>	78.468	95.012	134.468	-	134.468	73.059	82.570	113.856	97.660	Continuing	Continuing

Remarks

D. Acquisition Strategy

In order to optimize the performance of the BMDS, MDA leverages the nation's engineering Centers of Excellence at government agencies and Military Services, FFRDCs, UARCs, and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution to the BMDS. MDA will acquire products and services by competitive means to the extent practical.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MT23 / Enabling - Test
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Analysis - Engineering & Analysis - CSS Support	C/CPFF	MiDAESS / TEAMS : AL	1.000	0.494	Oct 2015	1.514	Oct 2016	1.526	Nov 2017	-		1.526	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - FFRDC	MIPR	Aerospace : AL	0.000	0.346	Nov 2015	0.385	Nov 2016	0.391	Nov 2017	-		0.391	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - Industry	C/CPAF	Boeing : VA, AL	5.594	2.111	Oct 2015	2.382	Nov 2016	4.486	Nov 2017	-		4.486	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - Integration Support CSS	C/CPAF	COLSA : AL, CO	2.790	5.076	Nov 2015	5.328	Nov 2016	7.505	Nov 2017	-		7.505	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - OGA Support	MIPR	AMRDEC : AL	6.557	6.182	Oct 2015	7.301	Nov 2016	7.032	Nov 2017	-		7.032	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - OGA Support - NME	MIPR	LTPO : AL	0.000	0.000		0.000		1.652	Nov 2017	-		1.652	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - Technical Support	C/CPAF	Northrop Grumman : VA, AL	1.354	1.205	Oct 2015	0.000		0.000		-		0.000	0	2.559	0
Engineering and Analysis - Engineering & Analysis - Test Engineering Support	Various	Various : AL, CO, VA	0.930	0.629	Nov 2015	0.839	Nov 2016	0.175	Nov 2017	-		0.175	Continuing	Continuing	Continuing
Subtotal			18.225	16.043		17.749		22.767		-		22.767	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MT23 / Enabling - Test
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.225	16.043	17.749	22.767	-	22.767	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MT23 / Enabling - Test
--	---	--

	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022		
	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Integrated Master Test Plan (IMTP) Engineering Inputs - 1Q - 2016	▲																				
Integrated Master Test Plan (IMTP) Engineering Inputs - 4Q - FY 2016				▲																	
Integrated Master Test Plan (IMTP) Engineering Inputs - 1Q - FY 2017					△																
Integrated Master Test Plan (IMTP) Engineering Inputs - 3Q - FY 2017						△															
IMTP Engineering Inputs - 1Q - FY 2018							△														
IMTP Engineering Inputs - 3Q - FY 2018								△													
FT0-03 E1 (OTA, Intercept Flight Test)								△													
IMTP Engineering Inputs - 1Q - FY 2019									△												
IMTP Engineering Inputs - 3Q - FY 2019										△											
FT0-03 E2 (OTA, Intercept Flight Test)										△											
IMTP Engineering Inputs - 1Q - FY 2020											△										
IMTP Engineering Inputs - 3Q - FY 2020												△									
IMTP Engineering Inputs - 1Q - FY 2021													△								
IMTP Engineering Inputs - 2Q - FY 2016																			△		
IMTP Engineering Inputs - 1Q - FY2022																					△
IMTP Engineering Inputs - 3Q - FY 2022																					△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MT23 / Enabling - Test

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Integrated Master Test Plan (IMTP) Engineering Inputs - 1Q - 2016	1	2016	1	2016
Integrated Master Test Plan (IMTP) Engineering Inputs - 4Q - FY 2016	4	2016	4	2016
Integrated Master Test Plan (IMTP) Engineering Inputs - 1Q - FY 2017	1	2017	1	2017
Integrated Master Test Plan (IMTP) Engineering Inputs - 3Q - FY 2017	3	2017	3	2017
IMTP Engineering Inputs - 1Q - FY 2018	1	2018	1	2018
IMTP Engineering Inputs - 3Q - FY 2018	3	2018	3	2018
FT0-03 E1 (OTA, Intercept Flight Test)	3	2018	3	2018
IMTP Engineering Inputs - 1Q - FY 2019	1	2019	1	2019
IMTP Engineering Inputs - 3Q - FY 2019	3	2019	3	2019
FT0-03 E2 (OTA, Intercept Flight Test)	2	2019	2	2019
IMTP Engineering Inputs - 1Q - FY 2020	1	2020	1	2020
IMTP Engineering Inputs - 3Q - FY 2020	3	2020	3	2020
IMTP Engineering Inputs - 1Q - FY 2021	1	2021	1	2021
IMTP Engineering Inputs - 2Q - FY 2016	3	2021	3	2021
IMTP Engineering Inputs - 1Q - FY2022	1	2022	1	2022
IMTP Engineering Inputs - 3Q - FY 2022	3	2022	3	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs				Project (Number/Name) MD28 / Intelligence & Security			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD28: <i>Intelligence & Security</i>	107.954	39.085	41.254	44.708	-	44.708	44.557	47.744	48.732	49.477	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2018, funding for Cyber related portion of Insider Threat mitigation has been transferred to project MC31, Engineering - Cyber.

A. Mission Description and Budget Item Justification

The Intelligence and Security program provides multi-disciplinary intelligence and security for the BMDS acquisition, development, test and deployment. The Intelligence and Security Major Program Goals are:

- Ensure the Intelligence Community (IC) understands and fulfills MDA's current and future prioritized intelligence requirements; advocate BMDS test intelligence requirements; and work closely with the IC.
- Leverage available National and DoD Counterintelligence resources. Ensure counterintelligence products and services are fully integrated into all RDT&E programs and activities to protect classified information and critical technologies and to protect MDA and BMDS personnel, facilities, information and activities.
- Define cybersecurity systems engineering requirements for BMDS assets. Identify cybersecurity systems engineering and infrastructure intelligence requirements to focus IC collection, analysis and production to target MDA/BMDS cyber vulnerabilities. Incorporate cybersecurity engineering requirements into the BMDS systems engineering process.
- Provide cross-Agency acquisition security oversight and support for the identification and protection of Critical Program Information (CPI), and evaluation and implementation of developing Supply Chain Risk Management (SCRM) requirements. Provide physical security for BMDS weapons/sensor system deployments, including Foreign Military Sales (FMS). Implement MDA's information security and declassification programs. Strengthen Test and Operations Security (OPSEC) across the Agency.

The Security and Intelligence Project captures five specific areas: 1) Intelligence; 2) Counterintelligence; 3) Cybersecurity Engineering; 4) Program Protection (formerly Research, Development, and Acquisition (RDA) Security); and 5) Threat Systems Engineering. Collectively, these efforts provide critical information regarding threat ballistic missile system capabilities; protection of personnel, activities, and technology from espionage and terrorism; and identification and mitigation of BMDS system vulnerabilities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Intelligence	8.510	9.203	10.324
Articles:	-	-	-
Description: The Intelligence program provides expertise to develop intelligence products on threat ballistic missile system capabilities, and leverages unique intelligence-community developed, owned, and operated capabilities for the benefit and advocacy of the missile defense community. Program goals include: - Serve as designated intelligence broker between MDA and the Intelligence Community			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-- Maintain and communicate prioritized, specific BMDS intelligence requirements to the Intelligence Community.</p> <p>-- Maintain a focused dialog with members of the Intelligence Community to ensure understanding, urgency and context of MDA intelligence requirements.</p> <p>- Provide Current, Technical, Acquisition, Collection and Cyber intelligence to the BMDS throughout the acquisition life cycle.</p> <p>- Maintain and update MDA's knowledge base of foreign ballistic missile threats, including development, enhancement, and population of the Missile Threat Portals with Intelligence Community produced documents at the appropriate security classification levels.</p> <p>- Characterize all ballistic missile threat systems from adversaries for use by the MDA Systems Engineer, Program Managers, and Director for Test to perform modeling, simulation, and testing of the BMDS.</p> <p>- Maintain Missile Intelligence Secure Link (MISL) classified portal (full operational capability).</p> <p>FY 2016 Accomplishments:</p> <p>- Conducted activities listed in Description section (SEE ABOVE).</p> <p>FY 2017 Plans:</p> <p>- Conduct activities listed in Description section (SEE ABOVE).</p> <p>FY 2018 Plans:</p> <p>FY 2018 increase reflects need for additional, dedicated support to new BMDS programs (e.g., LRDR).</p> <p>- Conduct activities listed in Description section (SEE ABOVE).</p>				
Title: Counterintelligence		5.876	6.389	6.919
Articles:		-	-	-
<p>Description: The Counterintelligence Program detects, exploits or neutralizes espionage, foreign intelligence collection activities and terrorist activities conducted for or on behalf of foreign powers, organizations, persons, or their agents directed against U.S. national security interests, or DoD/MDA and its personnel, information, material, facilities, and activities. Program goals include:</p> <p>- Serve as MDA Liaison with Federal, State and Local Law Enforcement and Counterintelligence (CI) Organizations to report and resolve incidents involving MDA personnel, information and technologies.</p> <p>-- Engage National, Combatant Command and DoD CI resources to share and obtain threat information impacting MDA personnel, facilities, information, technologies, programs and activities, worldwide.</p> <p>-- Provide CI, technical and cyber threat support to MDA flight tests, conferences, and BMDS deployment activities worldwide, including FMS Programs, to detect, deter, or neutralize criminal, terrorist and foreign intelligence collection threats targeting MDA and BMDS technologies, personnel, facilities and activities.</p> <p>- Execute life cycle replacement of outdated technical surveillance countermeasures and cyber forensics gear to employ the latest technologies during conferences, flight tests and other classified activities to detect, deter and prevent the loss or compromise of classified or sensitive information to foreign adversary collection activities.</p>				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Conduct CI in Cyberspace activities to detect malicious and insider threat activities targeting MDA administrative and fire control networks. - Conduct MDA Insider Threat Program to identify, deter and mitigate potential insider threats. - Provide required CI Awareness and Reporting training to MDA workforce. - Provide CI research and assistance for cyber forensics and analysis to identify insider and foreign entity cyber threats to MDA computer networks and BMDS fire control systems. - Conduct CI research and analysis to produce CI threat products that address foreign intelligence, cyber and international terrorist threats to MDA personnel, facilities, information, systems and activities worldwide. - Maintain technical surveillance countermeasures and cyber forensic gear to detect, identify and neutralize adversary collection platforms and capabilities used to gain unauthorized access to MDA classified and controlled unclassified information. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). - Expanded Insider Threat Mitigation Cell activity to address Presidentially mandated Full Operational Capability (FOC) compliance. <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2018 Plans:</p> <p>FY 2018 increase reflects need for additional Cyber Assessment Team assets.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). 				
Title: Cybersecurity Engineering Program		4.687	4.958	4.537
		Articles: -	-	-
<p>Description: The Cybersecurity Engineering Program is focused on developing designs and solutions to protect the BMDS from existing and emerging cyber threats through coherent cybersecurity systems engineering. Program goals include:</p> <ul style="list-style-type: none"> - Ensure Cybersecurity is integrated into the Acquisition Process. - Assess the Cybersecurity Architecture to address gaps/disconnects, enhance interoperability, and realize efficiencies across all mission systems. Define the "As Built" and "To Be" Cybersecurity Systems Engineering concepts to strengthen technical assessments and cybersecurity design solutions and implementation recommendations impacted by the change in requirements. -- Develop and coordinate near-term and long-term engineering changes to the BMDS -- Develop requirements for building cybersecurity into incremental BMDS Hardware and Software builds -- Monitor allocation of these requirements to the Elements. -- Recommend updates to the BMDS Core Standards, including Cyber-related requirements specified by the Agency, the Combatant Commanders (CCMDs), the DoD, and the Federal Government. 				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-- Perform cybersecurity systems engineering assessments for proposed BMD System Specification and interface changes and additions.</p> <ul style="list-style-type: none"> - Provide and recommend updates to cybersecurity systems engineering policy and guidance for BMDS system design and acquisition to enhance BMDS resiliency against cyber threats - Implement cybersecurity engineering resiliency techniques. - Provide objectives and requirements for Cybersecurity testing. - Provide independent cybersecurity reviews at critical engineering milestones. - Provide information system security engineering by assessing cybersecurity requirements, design, and implementations and provide recommendations to address architecture gaps or shortfalls. - Implement cyber threat mitigation strategies within BMDS architecture, design, system requirements, and specifications documentation to ensure traceability to necessary components and interfaces that make up the BMDS mission. - Coordinate evaluation of cybersecurity capability during BMDS tests. - Develop verification and assessment strategies for system cybersecurity requirements. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2018 Plans:</p> <p>Beginning in FY 2018, funding for Cyber related portion of Insider Threat mitigation has been transferred to project MC31, Engineering - Cyber.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). 				
<p>Title: Program Protection</p> <p align="right">Articles:</p> <p>Description: Program Protection (formerly RDA Security) protects BMDS information, Critical Program Information, technologies, and deploying systems; develops and coordinates Security Classification Guides; and performs declassification reviews to identify equities that warrant continued protection in order to preserve the technological advantage of the BMDS. Program Protection also coordinates MDA intelligence, counterintelligence and security to help BMDS test activities. Program goals include:</p> <ul style="list-style-type: none"> - Perform reviews required for all Agency public release, security classification, and FOIA and Mandatory Declassification Reviews to ensure sensitive BMDS information is not inadvertently released into the public domain. - Perform Information Security program management and oversee implementation by MDA programs <p>-- Perform internal program reviews, policy oversight and implementation, and training to identify and fix deficiencies and protect critical BMDS information</p>		10.072 -	10.965 -	11.998 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017		FY 2018
---	----------------	----------------	--	----------------

<ul style="list-style-type: none"> -- Collect information required for annual reports and communicate security posture to leadership - Provide security oversight for the Agency's classified contracts by drafting and coordinating DD254 "Contract Security Classification Specification" documents. - Execute an effective SCRM program to prevent unmitigated risks from degrading the performance of components and systems across the BMDS supply chain. - Provide dedicated on-site security and protection of BMDS resources and personnel at operational sites in Alaska, California and Colorado to ensure security protection coverage of the BMDS mission operations and test assets based in those regions. - Perform systematic Declassification reviews on historical Agency information to prevent unauthorized disclosures due to automatic declassification requirements. - Identify and integrate Physical Security requirements for overseas sites with existing or planned missile defense weapons or sensor systems to ensure protection of deployed sites. - Provide effective physical protection to low density/high demand emerging warfighter capability. - Expand security activities to include FMS. - Conduct program protection planning for the continuing assessment of candidate critical program information for Advanced Technology programs and reassessment of other BMDS programs affected by technical baseline changes; ensure critical technologies embedded in missile defense systems are not vulnerable to compromise. - Keep pace with mission growth in program protection, system security engineering, acquisition security, and SCRM. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (SEE ABOVE). <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). 				
--	--	--	--	--

Title: Threat Systems Engineering	9.940	9.739		10.930
Articles:	-	-		-

Description: Threat Engineering provides representations of adversary missile capabilities based on available intelligence information, and develops, coordinates, and baselines BMDS-level targets and countermeasures requirements to define target capabilities required to meet BMDS flight test objectives. Program goals include:

- Develop threat definitions for system specifications
- Produce threat / scenario data for BMDS development events
- Perform Threat Verification and Validation analysis to verify missile models meet specifications and are consistent with intelligence assessments.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Produce Adversary Data Package (ADP) updates. - Develop target requirements to ensure flight test targets meet operationally realistic conditions. - Produce Target Assessment and Certification Reports. - Assess threat representation of flight test targets. - Develop target system specifications and guide targets requirements development, planning, and certification for BMDS flight tests. - Analyze flight test target performance relative to threat intelligence assessments to support target system verification and certification. - Provide Technical Data for major reviews (System Requirements Reviews, Critical Design Reviews, etc.) - Complete Target Specification builds. - Update MDA INS 5000.06, Target Class Capabilities and Requirements documents as necessary. <p>FY 2016 Accomplishments: - Conducted activities listed in Description section (SEE ABOVE).</p> <p>FY 2017 Plans: - Conduct activities listed in Description section (SEE ABOVE).</p> <p>FY 2018 Plans: FY 2018 increase enables threat systems engineering team to maintain flexibility needed to address threat variations. - Conduct activities listed in Description section (SEE ABOVE).</p>			
Accomplishments/Planned Programs Subtotals	39.085	41.254	44.708

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0305103C: <i>Cyber Security Initiative</i>	0.941	0.969	0.986	-	0.986	0.997	1.031	1.051	1.073	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project leverages expertise in the intelligence community, counterintelligence community, and information assurance community, including the Military Services, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution to the BMDS. Products and Services will be acquired by competitive means to the extent that is beneficial and practical.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>	Project (Number/Name) MD28 / <i>Intelligence & Security</i>
--	--	---

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Intelligence - Intelligence Analysis & Support	Allot	MDA : VA, AL, CO	12.741	4.126	Nov 2015	3.832	Oct 2016	4.779	Oct 2017	-		4.779	Continuing	Continuing	Continuing
Intelligence - Intelligence Support	C/CPFF	MIDAESS / TEAMS : AL, VA, CO	13.041	3.809	Nov 2015	4.746	Nov 2016	4.988	Nov 2017	-		4.988	Continuing	Continuing	Continuing
Intelligence - Intelligence Support (2)	C/CPFF	Northrop Grumman : AL, CO	0.856	0.575	Nov 2015	0.625	Nov 2016	0.557	Nov 2017	-		0.557	Continuing	Continuing	Continuing
Intelligence - Prior year Intelligence Support no longer funded in FYDP	Various	Various : Various	7.770	0.000		0.000		0.000		-		0.000	0	7.770	0
Counterintelligence - CI Analysis & Support	Allot	MDA : AL, CO, VA	4.829	2.109	Nov 2015	1.468	Oct 2016	1.892	Oct 2017	-		1.892	Continuing	Continuing	Continuing
Counterintelligence - CI Analysis and Support 3	C/CPFF	MIDAESS / TEAMS : AL, CO, VA	7.820	3.105	Nov 2015	4.514	Nov 2016	4.020	Nov 2017	-		4.020	Continuing	Continuing	Continuing
Counterintelligence - CI Insider Threat Analysis	C/CPFF	MIDAESS / TEAMS : VA	0.000	0.662	Nov 2015	0.407	Nov 2016	0.000		-		0.000	0	1.069	0
Counterintelligence - CI Surveillance Gear	Various	Various : Various	0.000	0.000		0.000		1.007	Dec 2017	-		1.007	Continuing	Continuing	Continuing
Cybersecurity Engineering Program - Cybersecurity - FFRDC	FFRDC	Aerospace : CA, VA	1.770	0.755	Nov 2015	0.754	Nov 2016	0.384	Nov 2017	-		0.384	Continuing	Continuing	Continuing
Cybersecurity Engineering Program - Cybersecurity - FFRDC (2)	FFRDC	MITRE : VA, AL	1.204	0.755	Nov 2015	0.754	Nov 2016	1.145	Nov 2017	-		1.145	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cybersecurity Engineering Program - Cybersecurity Engineering	Allot	MDA : VA, AL	7.072	2.259	Nov 2015	2.355	Oct 2016	2.467	Oct 2017	-		2.467	Continuing	Continuing	Continuing
Cybersecurity Engineering Program - Cybersecurity Engineering CSS	C/CPFF	MIDAESS / TEAMS : VA, AL	0.815	0.918	Nov 2015	1.095	Nov 2016	0.541	Nov 2017	-		0.541	Continuing	Continuing	Continuing
Program Protection - Declassification Analysis	C/CPFF	MIDAESS / TEAMS : VA, AL	4.020	1.623	Nov 2015	1.853	Nov 2016	2.183	Nov 2017	-		2.183	Continuing	Continuing	Continuing
Program Protection - Program Protection Analysis	Allot	MDA : VA, AL	13.050	3.592	Nov 2015	4.250	Oct 2016	4.550	Oct 2017	-		4.550	Continuing	Continuing	Continuing
Program Protection - Program Protection Analysis & Support	C/CPFF	MIDAESS / TEAMS : AL, AK, CA, CO, VA	10.866	4.346	Nov 2015	4.322	Nov 2016	4.665	Nov 2017	-		4.665	Continuing	Continuing	Continuing
Program Protection - Program Protection Support	Various	Various : AL, VA, CO	1.666	0.511	Nov 2015	0.540	Nov 2016	0.600	Nov 2017	-		0.600	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat Systems Engineering	Various	MDA : VA, AL, CO	5.280	3.153	Nov 2015	2.116	Oct 2016	5.353	Oct 2017	-		5.353	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat Systems Engineering - CSS	C/CPFF	MIDAESS / TEAMS : AL, MD, VA	7.679	3.878	Nov 2015	4.218	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat Systems Engineering - CSS (2)	C/CPFF	MIDAESS / TEAMS : VA, AL	2.049	1.958	Nov 2015	2.230	Nov 2016	2.971	Nov 2017	-		2.971	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat Systems Engineering - FFRDC	FFRDC	MIT/LL : MA	1.869	0.000		0.000		1.174	Nov 2017	-		1.174	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat	FFRDC	JHU/APL : MD	2.233	0.000		0.000		1.432	Nov 2017	-		1.432	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering - UARC															
Threat Systems Engineering - Unique RCS	FFRDC	NSWC Corona : CA, MD	1.324	0.951	Nov 2015	1.175	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			107.954	39.085		41.254		44.708		-		44.708	-	-	-

Remarks
NASIC - National Air and Space Intelligence Center

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	107.954	39.085	41.254	44.708	-	44.708	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>	Project (Number/Name) MD28 / <i>Intelligence & Security</i>
--	--	---

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
--	-------------	---------	---------	--------------	-------------	---------------	------------------	------------	--------------------------

Remarks
 Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security
--	---	--

	Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆						
	Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇						
	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022				
MD28 Intelligence & Security	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Adversary Data Package (ADP) - 2017																							
Submit Annual MDA OPSEC Report to USD(I) - 2017																							
Complete Annual Declassification Review - 2017																							
ADP - 2018																							
Submit Annual MDA OPSEC Report to USD(I) - 2018																							
Complete Annual Declassification Review - 2018																							
ADP - 2019																							
Submit Annual MDA OPSEC Report to USD(I) - 2019																							
Complete Annual Declassification Review - 2019																							
ADP - 2020																							
Submit Annual MDA OPSEC Report to USD(I) - 2020																							
Complete Annual Declassification Review - 2020																							
ADP - 2021																							
Submit Annual MDA OPSEC Report to USD(I) - 2021																							
Complete Annual Declassification Review - 2021																							
ADP - 2022																							
Submit Annual MDA OPSEC Report to USD(I) - 2022																							
Complete Annual Declassification Review - 2022																							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD28 / Intelligence & Security
--	---	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD28 Intelligence & Security	1	2016	4	2022
Adversary Data Package (ADP) - 2017	4	2017	4	2017
Submit Annual MDA OPSEC Report to USD(I) - 2017	4	2017	4	2017
Complete Annual Declassification Review - 2017	4	2017	4	2017
ADP - 2018	4	2018	4	2018
Submit Annual MDA OPSEC Report to USD(I) - 2018	4	2018	4	2018
Complete Annual Declassification Review - 2018	4	2018	4	2018
ADP - 2019	4	2019	4	2019
Submit Annual MDA OPSEC Report to USD(I) - 2019	4	2019	4	2019
Complete Annual Declassification Review - 2019	4	2019	4	2019
ADP - 2020	4	2020	4	2020
Submit Annual MDA OPSEC Report to USD(I) - 2020	4	2020	4	2020
Complete Annual Declassification Review - 2020	4	2020	4	2020
ADP - 2021	4	2021	4	2021
Submit Annual MDA OPSEC Report to USD(I) - 2021	4	2021	4	2021
Complete Annual Declassification Review - 2021	4	2021	4	2021
ADP - 2022	4	2022	4	2022
Submit Annual MDA OPSEC Report to USD(I) - 2022	4	2022	4	2022
Complete Annual Declassification Review - 2022	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs				Project (Number/Name) MD30 / BMD Information Management Systems			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD30: BMD Information Management Systems	234.332	90.685	92.628	84.499	-	84.499	81.337	89.036	91.592	95.019	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018, consolidated \$4.343 million of IT funding from MD24 to MD30 for more efficient execution.

A. Mission Description and Budget Item Justification

The BMD Information Management Systems budget project funds information technology mission critical functions necessary for the efficient operations and safeguarding of BMD information in compliance with DoD policies and in keeping with the President's declaration on 29 May 2009, "cyber threat is one of the most serious economic and national security challenges we face as a nation". IT is critical to the day-to-day functions of MDA personnel to communicate (classified and unclassified) with each other, Congress, senior DoD and other U.S. government agency personnel, Combatant Commander's, NATO partners, and other industry partners. Communication among these organizations facilitates the MDA mission of developing and fielding an integrated BMDS to defend the United States, our deployed forces, allies, and friends against all ranges of enemy ballistic missiles in all phases of flight.

MDA information management systems capabilities support rigorous missile defense Research, Development, Test and Engineering (RDT&E) and facilitate the development of technologies to guard against evolving missile threat. Communications are vital for missile defense to continue a viable homeland defense against rogue threats and to provide the integration required to defend deployed forces, allies, and friends against theater threats. The BMD information management consists of MDA Special Purpose Processing Nodes (SPPNs), IT systems, data centers, operations and monitoring centers which are vital to support the strategic mission of the Agency and necessary to meet disaster recovery and continuity of operations requirements. This infrastructure is required to sustain access to the Secret Internet Protocol Router Network (SIPRNET), Non secure Internet Protocol Router Network (NIPRNET), MDA classified and unclassified networks, classified and unclassified video teleconferencing services, test and business knowledge data centers, the Defense Research Engineering Network (DREN). These mission critical functions provide for the efficient operation and safeguarding of all agency information in locations supporting MDA around the world.

Project MD30 was realigned into the following inter-agency mission critical IT services and the associated plans to align with the Federal Information Technology Shared Services Strategy.

1. End User Support
2. Special Purpose Processing Nodes (SPPNs)
3. IT Planning and Solutions
4. Unified Communications
5. Portal and Data Services

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems

6. Business Automation Services

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Title: End User Support</p> <p align="right">Articles:</p> <p>Description: Provides IT operations, support and maintenance (18 hours a day, six days a week) to over 10,500 MDA worldwide users (classified and unclassified) executing the Research, Development, Test and Engineering (RDT&E) mission. Services include Integrated Service Desk support (Help Desk and Client Support Services); management of hardware and software maintenance and licensing; and monitoring network activity to ensure users comply with DoD policies for the proper use of information systems. Services also include printing and copying; email and file; directory and authentication services. Includes investments in equipment at end-of-life to comply with Federal and DoD mandated cybersecurity policies. Provides life-cycle management of over 190,000 IT assets including IT procurement, receiving, shipping/transportation, warehousing, transfers and disposal using the Defense Property Accountability System (DPAS).</p> <p>FY 2016 Accomplishments: Refer to the Description section - See above.</p> <p>-Implemented secure Public Key Infrastructure (PKI) identity management for external system users (Defense Industrial Base (DIB)) and Combatant Commands that require access to MDA systems, networks and RDT&E data stores.</p> <p>FY 2017 Plans: Refer to the Description section - See above.</p> <p>FY 2018 Plans: Refer to the Description section - See above.</p>	19.326	18.859	19.694
Articles:	-	-	-
<p>Title: Special Purpose Processing Nodes (SPPNs) (formerly Network and Infrastructure Services)</p> <p align="right">Articles:</p> <p>Description: Provides for the developmental engineering and operational strategies and concepts; and planning, design, implementation and maintenance for MDA Research, Development, Test and Evaluation (RDT&E) Special Purpose Processing Nodes (SPPNs) in Huntsville, AL and Colorado Springs, CO. The SPPN infrastructure consists of routers, switches, firewalls, compute, storage and intrusion detection systems that provide IT support to over 10,500 MDA classified/unclassified users worldwide. The SPPNs support dynamic and rapid modifications and reconfigurations of network infrastructure in support of RDT&E mission and event unique configurations. Funds provide for network operations and performance monitoring; development of detailed solutions, designs, and plans; Disaster Recovery and Continuity of Operations (DR/COOP) rehearsals; Internet access management; and web filtering. Sustains core communications distribution services across the MDA Enterprise. Includes investments in equipment at end-of-life to comply with Federal and DoD mandated cybersecurity policies. Plan, engineer</p>	30.613	30.636	19.301
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>and implement sustainment projects for general IT services and business systems consistent with the IT architecture roadmap. In addition, funds will be used to execute BMDS Positioning, Navigation and Timing (PNT) Last Mile Integration for six (6) Ballistic Missile Defense System (BMDS) sites leveraging the DoD Chief Information Officer Regional Clock installations at BMDS locations. This effort includes integration and test capabilities for element interface verification and provide operations and sustainment of the deployed PNT Last Mile integration capabilities at BMDS locations.</p> <p>FY 2016 Accomplishments: Refer to the Description section - see above.</p> <p>-Implemented a network surveillance capability to manage network performance during BMDS global test events (NetScout) -Implemented DoD-compliant solution for position, navigation and timing -Implemented an MDA RDT&E cloud environment for compute and storage to enable rapid provisioning during BMDS test events</p> <p>FY 2017 Plans: Refer to the Description section - see above.</p> <p>FY 2018 Plans: Refer to the Description section - see above.</p> <p>The \$11.335 million decrease from FY 2017 to FY 2018 reflects the cost sharing strategy for SPPN services used by the MDA BMDS Programs to accomplish their RDT&E mission.</p>				
<p>Title: Information Technology (IT) Planning and Solutions</p> <p align="right">Articles:</p> <p>Description: Provides IT engineering support for new requirements analysis, design, planning and implementation of IT solutions for real-world issues. Addresses the increasing demand for more complex IT products and highly specialized IT services. Manages the prioritization and integration of investments in the MDA IT Portfolio to ensure compliance with Federal and DoD policies. Supports the MDA Chief Information Officer Enterprise Architecture Board, Project Steering Committee and the Change Control Board. Ensures compliance with Federal Laws, DoD policies, directives and regulations including: Clinger-Cohen Act, the Federal Information Security Management Act (FISMA), and Office of Management and the Office of Management and Budget (OMB) IT budget reporting policies.</p> <p>FY 2016 Accomplishments: Refer to the Description section - see above.</p> <p>FY 2017 Plans:</p>		13.333 -	14.375 -	14.998 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
Refer to the Description section - see above.				
FY 2018 Plans: Refer to the Description section - see above.				
Title: Unified Communications		13.617	13.997	14.998
Articles:		-	-	-
Description: Provides for the management, operations and sustainment of classified and unclassified globally deployed video teleconferencing capabilities and equipment. Also includes unclassified desktop instant messaging, wireless services, and collaboration capabilities. Provides and implements engineering solutions for all unified communications services. Supports MDA global RDT&E mission for classified and unclassified voice and data circuits (wide area, local area and metropolitan area networks) and interfaces with the Defense Information System Network (DISN) Video Services Global (DVSG), the Defense Research and Engineering Network (DREN), Joint Service Provider (JSP) and commercial vendors. Maintenance agreements and licenses for MDA Enterprise network and telecommunications equipment (classified and unclassified mobile and desktop telephony devices).				
FY 2016 Accomplishments: -Deployed a DoD-compliant enterprise solution for MDA wireless communications (email and voice) to support the global RDT&E mission				
FY 2017 Plans: Refer to the Description section - See above.				
FY 2018 Plans: Refer to the Description section - See above.				
Title: Business Automation Services		7.266	7.930	8.087
Articles:		-	-	-
Description: Provides for the management, operation and maintenance of enterprise business applications for the MDA community to access and share various sources of available data, information and knowledge and enable improved organization, retrieval, manipulation, and storage. Operate and maintain nine Defense Business Systems that meet the reporting requirements of Title 10 United States Code section 2222; these include portal-based Electronic Learning Management System (E-LMS), Program Resource Internet Database Environment (PRIDE), Information Management Program Activity control Tool (IMPACT), Standard Procurement System (SPS), Human Resource Tracking System/Personnel Tracking System (HRTS/PTS), TEAMMATE, E-TASKER, Comprehensive Cost and Requirements (CCaR), Electronic Content and Records Tool (ECART).				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>FY 2016 Accomplishments: - Began implementation of Business Intelligence capability</p> <p>FY 2017 Plans: Refer to the Description section - See above.</p> <p>FY 2018 Plans: Refer to the Description section - See above.</p>			
<p>Title: Portal and Data Services</p> <p align="right">Articles:</p> <p>Description: Provides for the management, operation and maintenance support for the classified and unclassified MDA Portal application and the IT portal infrastructure. The support includes web-based developmental engineering and operations, planning, design, application implementation, content management and training. Also provides MDA Privacy Office and Civil Liberties compliance and reporting, and manages data storage capacity to accommodate MDA users.</p> <p>FY 2016 Accomplishments: -Implemented critical end-of-life replacement of MDA Knowledge On-line Portal infrastructure (SharePoint 2013) -Implemented a web-based capability to support global integration BMDS test, planning and execution (Microsoft Project)</p> <p>FY 2017 Plans: Refer to the Description section - see above.</p> <p>FY 2018 Plans: Refer to the Description section - see above.</p>	6.530 -	6.831 -	7.421 -
Accomplishments/Planned Programs Subtotals	90.685	92.628	84.499

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems
--	---	---

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603294C: Common Kill Vehicle Technology	60.851	0.000	252.879	-	252.879	321.175	110.934	0.000	0.000	Continuing	Continuing
• 0603881C: Ballistic Missile Defense Terminal Defense Segment	197.617	209.072	230.162	-	230.162	194.328	253.778	264.377	267.254	Continuing	Continuing
• 0603882C: Ballistic Missile Defense Midcourse Defense Segment	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: Ballistic Missile Defense Sensors	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603892C: AEGIS BMD	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603893C: Space Tracking and Surveillance System	27.262	32.129	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603895C: Ballistic Missile Defense System Space Programs	21.040	20.690	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603896C: Ballistic Missile Defense Command and Control, Battle Management & Communication	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603898C: Ballistic Missile Defense Joint Warfighter Support	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
• 0603904C: Missile Defense Integration and Operations Center (MDIOC)	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: Sea Based X-Band Radar (SBX)	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0603913C: Israeli Cooperative Programs	267.595	103.835	105.354	-	105.354	108.002	109.742	111.901	114.219	Continuing	Continuing
• 0603914C: Ballistic Missile Defense Test	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: Ballistic Missile Defense Targets	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems
--	---	---

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	
			Base	OCO	Total					Complete	Total Cost
• 0604880C: Land Based SM-3 (LBSM3)	29.288	43.293	30.486	-	30.486	31.816	33.024	31.707	30.924	Continuing	Continuing
• 0604881C: AEGIS SM-3 Block IIA Co-Development	165.456	106.038	9.739	-	9.739	0.000	0.000	0.000	0.000	0	281.233
• 0901598C: Management HQ - MDA	35.871	31.160	29.947	-	29.947	28.024	27.269	27.878	28.450	Continuing	Continuing

Remarks

D. Acquisition Strategy

This acquisition strategy to provide IT services for MDA consists of three MDA issued contracts. The Joint National Integration Center Research and Development Contract (JRDC) provides IT design, engineering, implementation and sustainment services. The JRDC contract expires in July 2017 and is being re-competed as Full and Open under the name of Integration, Research and Engineering Solutions (IRES).

The Network Management Resources (NMR) contract provides Video Teleconferencing, Portal, Data and Business Automation services. The NMR contract expires in November 2017 and is being re competed as a Service Disabled Veteran Owned Small Business Set Aside under the new name of Research & Development Enterprise Collaboration Services (RECS).

MDA issues multiple Military Interdepartmental Purchase Requisitions (MIPRs) for leased communications including DISA, DREN and the US Army.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
End User Support - End User Civilian Pay/Travel/PCS	Allot	MDA Civilian Pay : AL, CO, NM, VA	8.564	3.121	Oct 2015	3.148	Oct 2016	3.213	Oct 2017	-		3.213	Continuing	Continuing	Continuing
End User Support - End User Civilian Travel	Allot	MDA Civilian Travel : AL, AK, CA, CO, HI, NM, VA	0.652	0.223	Oct 2015	0.228	Oct 2016	0.232	Oct 2017	-		0.232	Continuing	Continuing	Continuing
End User Support - End User IT Hardware/Software Support	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	16.577	8.590	Oct 2015	7.483	Oct 2016	7.071	Feb 2018	-		7.071	Continuing	Continuing	Continuing
End User Support - End User IT Licenses	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	9.538	1.138	Oct 2015	1.161	Oct 2016	1.744	Feb 2018	-		1.744	Continuing	Continuing	Continuing
End User Support - End User Operational Support	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	31.632	6.254	Oct 2015	6.839	Oct 2016	7.434	Feb 2018	-		7.434	Continuing	Continuing	Continuing
Special Purpose Processing Nodes (SPPNs) (formerly Network and Infrastructure Services) - SPPN Civilian Pay/Travel/PCS	Allot	MDA Civilian Pay : AL, CO, VA	3.445	1.271	Oct 2015	1.259	Oct 2016	1.280	Oct 2017	-		1.280	Continuing	Continuing	Continuing
Special Purpose Processing Nodes (SPPNs) (formerly	C/CPAF	Northrop Grumman : AL, CO, VA	38.075	13.275	Oct 2015	13.450	Oct 2016	9.037	Feb 2018	-		9.037	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network and Infrastructure Services) - SPPN Licenses															
Special Purpose Processing Nodes (SPPNs) (formerly Network and Infrastructure Services) - SPPN Operational Support	C/CPAF	Northrop Grumman : AL, CO, VA	33.930	16.067	Oct 2015	15.927	Oct 2016	8.984	Feb 2018	-		8.984	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions - IT Planning and Solutions Advisory and Assistance Services	C/CPFF	Colsa : AL, CO, VA	6.070	4.563	Mar 2016	4.713	Mar 2017	5.755	Mar 2018	-		5.755	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions - IT Planning and Solutions Civilian Pay/Travel/PCS	Allot	MDA Civilian Pay : AL, CO, VA	2.696	0.936	Oct 2015	0.955	Oct 2016	0.960	Oct 2017	-		0.960	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions - IT Planning and Solutions OMB, OSD, and DOD Compliance Monitoring and Reporting/Contract Deliverable	C/CPFF	Colsa : AL, CO, VA	0.670	0.164	Oct 2015	0.167	Oct 2016	0.128	Mar 2018	-		0.128	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions - IT Planning and Solutions Operational Support	C/CPAF	Northrop Grumman : AL, CO, VA	15.373	7.670	Oct 2015	7.664	Feb 2017	8.155	Feb 2018	-		8.155	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions - MDA Agency Business Operations	Allot	MDA Business Operations : AL, CO, VA	1.904	0.000		0.876		0.000		-		0.000	Continuing	Continuing	Continuing
Unified Communications - Unified Communications Civilian Pay/Travel/PCS	Allot	MDA Civilian Pay : AL, CO, VA	3.725	0.780	Oct 2015	1.102	Oct 2016	1.120	Oct 2017	-		1.120	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Unified Communications - Unified Communications Leased Communications/Licenses	MIPR	DISA/DREN/IT2S : AL, AK, CA, CO, HI, NM, VA	13.776	2.001	Oct 2015	2.074	Oct 2016	2.813	Oct 2017	-		2.813	Continuing	Continuing	Continuing
Unified Communications - Unified Communications Operational Support	C/CPAF	Northrop Grumman : AL, CO, VA	4.827	2.008	Feb 2016	2.047	Feb 2017	2.088	Feb 2018	-		2.088	Continuing	Continuing	Continuing
Unified Communications - Unified Communications VTC Operations Support	C/CPIF	NMR : AL, AK, CO, NM, VA	15.406	6.707	Nov 2015	6.802	Nov 2016	6.966	Nov 2017	-		6.966	Continuing	Continuing	Continuing
Unified Communications - Unified Communications Wireless Services	C/FFP	AT&T : AL, CO, VA	0.000	2.121	Nov 2015	1.972	Nov 2016	2.011	Nov 2017	-		2.011	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Civilian Pay/Travel/PCS	Allot	MDA Civilian Pay : AL, CO, VA	2.247	0.468	Oct 2015	0.472	Oct 2016	0.480	Oct 2017	-		0.480	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Licenses	C/CPAF	Northrop Grumman : AL, CO, VA	2.646	0.916	Oct 2015	0.934	Oct 2016	0.953	Feb 2018	-		0.953	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Operational Support	C/CPAF	Northrop Grumman : AL, CO, VA	4.383	5.863	Oct 2015	6.503	Oct 2016	6.632	Feb 2018	-		6.632	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Services Support	MIPR	CACI : AL, CO, VA	0.040	0.019	Mar 2016	0.021	Oct 2016	0.022	Oct 2017	-		0.022	Continuing	Continuing	Continuing
Portal and Data Services - Portal and Data Services Civilian Pay/Travel/PCS	Allot	MDS Civilian Pay : AL, CO, VA	2.696	0.936	Oct 2015	0.944	Oct 2016	0.800	Oct 2017	-		0.800	Continuing	Continuing	Continuing
Portal and Data Services - Portal and Data Services Licenses and Maintenance	C/CPAF	Northrop Grumman : AL, CO, VA	5.216	1.573	Oct 2015	1.605	Oct 2016	1.627	Feb 2018	-		1.627	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Portal and Data Services - Portal and Data Services Operational	C/CPAF	Online Subscriptions Services : AL, CO, VA	1.022	0.408	Oct 2015	0.416	Oct 2016	0.408	Oct 2017	-		0.408	Continuing	Continuing	Continuing
Portal and Data Services - Portal and Data Services Operational Support	C/FFP	NMR : AL, CO, VA	9.222	3.613	Oct 2015	3.866	Oct 2016	4.586	Nov 2017	-		4.586	Continuing	Continuing	Continuing
Subtotal			234.332	90.685		92.628		84.499		-		84.499	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	234.332	90.685	92.628	84.499	-	84.499	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency							Date: May 2017			
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs			Project (Number/Name) MD30 / BMD Information Management Systems				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems
--	---	---

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
Operate, Monitor and Sustain Recurring Operations for Video Conferencing for Unified Communications Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Manage DoD Mandated Business Applications and Sustain MDA Financial and Contractual Support Systems - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Operate and Maintain General Information Technology Services 18 hours per day, 6 days per week - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Revise and Test Contingency Plans for Information Technology Systems - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Operate and Maintain Classified and Unclassified MDA Knowledge Online Services - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Procure, Implement, and Asset Control for Information Technology Operational Systems -Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Provide 18 hours per day, 6 days per week Network and Helpdesk Services for General Information Technology Services for MDA Workforce - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Fund Recurring Leased Circuits, Maintenance Agreements and Licenses for MDA Enterprise - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Operate, Monitor and Sustain Recurring Classified and Unclassified Telecommunication Requirements for Unified Communications - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Sustain the BMDS Integrated Master Schedule and the Ballistic Missile Defense Asset Management Tool - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Perform Analysis, Track, and Report Metrics on Equipment Lifecycle - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Sustain the Information Technology Infrastructure Across the MDA Enterprise - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Test Asset Flyaway Kit Interface Testing						◇	◇	◇						
PNT Last Mile Integration 3 BMDS Sites							◇							
PNT Last Mile Integration 3 Additional BMDS Sites								◇						
PNT BMDS Last Mile Capability Operations & Sustainment									◇					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD30 / BMD Information Management Systems

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Operate, Monitor and Sustain Recurring Operations for Video Teleconferencing for Unified Communications Follow-On	1	2016	4	2022
Manage DoD Mandated Business Applications and Sustain MDA Financial and Contractual Support Systems - Follow-On	1	2016	4	2022
Operate and Maintain General Information Technology Services 18 hours per day, 6 days per week - Follow-On	1	2016	4	2022
Revise and Test Contingency Plans for Information Technology Systems - Follow-On	1	2016	4	2022
Operate and Maintain Classified and Unclassified MDA Knowledge Online Services - Follow-On	1	2016	4	2022
Procure, Implement, and Asset Control for Information Technology Operational Systems -Follow-On	1	2016	4	2022
Provide 18 hours per day, 6 days per week Network and Helpdesk Services for General Information Technology Services for MDA Workforce - Follow-On	1	2016	4	2022
Fund Recurring Leased Circuits, Maintenance Agreements and Licenses for MDA Enterprise - Follow-On	1	2016	4	2022
Operate, Monitor and Sustain Recurring Classified and Unclassified Telecommunication Requirements for Unified Communications - Follow-On	1	2016	4	2022
Sustain the BMDS Integrated Master Schedule and the Ballistic Missile Defense Asset Management Tool - Follow-On	1	2016	4	2022
Perform Analysis, Track, and Report Metrics on Equipment Lifecycle - Follow-On	1	2016	4	2022
Sustain the Information Technology Infrastructure Across the MDA Enterprise - Follow-On	1	2016	4	2022
Test Asset Flyaway Kit Interface Testing	2	2018	4	2018
PNT Last Mile Integration 3 BMDS Sites	3	2018	3	2018
PNT Last Mile Integration 3 Additional BMDS Sites	4	2018	4	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency			Date: May 2017	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>	Project (Number/Name) MD30 / <i>BMD Information Management Systems</i>		

Events	Start		End	
	Quarter	Year	Quarter	Year
PNT BMDS Last Mile Capability Operations & Sustainment	4	2018	4	2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs				Project (Number/Name) MC30 / Cyber Operations			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC30: <i>Cyber Operations</i>	31.503	27.194	22.881	41.458	-	41.458	45.070	56.616	73.479	56.086	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2018, this MC30 Cyber Operations Budget Project will consist of new Accomplishments that will map to the Office of Management and Budget (OMB) and Office of the Secretary of Defense (OSD) approved Cybersecurity Taxonomy. The new Accomplishments are: 1) Preventing Malicious Activity; 2) Detect, Analyze and Mitigate Intrusions, 3) Planning, Policy Development and Workforce Management and 4) Continuous Monitoring.

In FY 2018, \$10.585 million of IT funding was realigned from MD24 to MC30 for Cyber Operations priority efforts.

Increase from FY 2017 to FY 2018 of \$4.2M is for Positioning, Navigation and Timing (PNT) Last Mile Integration. Effort is non-cyber and will be realigned to Budget Project MD30.

A. Mission Description and Budget Item Justification

A number of key IT strategies were identified in the DoD Information Technology Enterprise Strategy and Roadmap issued by the Deputy Secretary of Defense in 2011. The IT Roadmap specifically addresses the need to improve Cybersecurity. It states that DoD networks are under constant attack from cybersecurity threats launched from various sources. MDA must meet the National Command Authority Directives for rapid deployment of the BMDS while complying with the key principles of the Cybersecurity standards to ensure MDA remains a secure member of the DoD Information Network (DODIN).

DoD Instruction 8500.01 Cybersecurity issued in March 2014, requires continuous monitoring, data analysis, reporting and incident mitigation of DoD classified and unclassified, mission, test and administrative networks. To comply with the Instruction, MDA must implement a multi-tiered cybersecurity risk management capability to protect critical BMD data and systems from rapidly evolving internal and external threats.

The issuance of DoD Instruction 8510.01, Risk Management Framework (RMF) Information Technology in March 2014 requires additional resources to implement, manage, monitor and report as a result of a thirty-five percent increase in controls (237 controls with 817 enhancements). DoD 8510.01 also states that resources for implementing the RMF must be identified and allocated as part of the Defense planning, programming, budgeting, and execution process. The Controls must be tested on all IT supporting research, development, test and evaluation and DoD-controlled IT operated by a contractor or other entity on behalf of DoD and reported.

The Cyber Operations budget project in the Enabling Program Element is executed by the MDA Chief Information Officer who has responsibility over the Agency Authorizing Official (AO). The project provides funds to sustain the Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Systems Security Officer (PM/ISSO) Plan of Action and Milestones (POA&M) for the MDA mission, test and administrative systems. It maintains the Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, and Cybersecurity Risk Assessment results, and Authorizing Official (AO) accreditation decisions) and POA&M on all MDA information systems. It supports the monitoring and tracking of Cybersecurity mitigations detailed in IT security POA&Ms. Activities include preparation of C&A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>	Project (Number/Name) MC30 / <i>Cyber Operations</i>
--	--	--

documentation and accreditation recommendations to the MDA PM/ISSO and AO. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with Federal Information Security Management Act(FISMA).

This project funds the MDA Security Operations Center (SOC), responsible for monitoring, managing, patching, and maintaining MDA network and core IT services; issuing and tracking Technical Compliance Orders; and coordinating overarching Enterprise NetOps. The SOC provides the network security operations centers and supporting processes to protect and defend BMDS and the MDA Enterprise information and information systems.

The MDA Computer Emergency Response Team (CERT), funded in this project, monitors the classified and unclassified information technology MDA administrative IT networks and reports vulnerabilities. The MDA CERT coordinates with U.S. Cyber Command to identify and implement network vulnerability updates and patches to comply with U.S. Cyber Command vulnerabilities identified for DoD networks.

The project funds Cybersecurity governance management and administrative management support, annual Agency-wide computer-based IA training and metrics reporting, implementation of Public Key Infrastructure and Enabling and COMSEC related activities.

Beginning in FY 2018, new Accomplishments will map to the Cybersecurity Taxonomy approved by OMB and OSD. The following are the recurring activities in each new accomplishment.

Recurring Activities for the Prevent Malicious Cyber Attacks Accomplishment:

- Maintain a current Information Assurance risk and residual risk assessment of the BMDS.
- Provide coordination on all IT projects and remote sites for Cybersecurity compliance.
- Implement methodologies and goals to identify insecure and unauthorized vectors of access to networks or applications, analyze the threat, attempt to exploit the vectors and confirm existence and analyze the risk for exploiting an application, network or service.
- Track ports, protocols, and services.
- Coordinate with private partnerships to ensure the Defense Industrial Base protects MDA data.

Recurring Activities for the Detect, Analyze and Mitigate Intrusions Accomplishment:

- Test RMF controls on all IT supporting research, development, test and evaluation and DoD-controlled IT operated by a contractor or other entity on behalf of DoD and reported.
- Conduct RMF analysis and reporting for the BMDS such as evaluation of residual risk by incorporating current and proposed BMDS monitoring and mitigations.
- Maintain MDA Computer Emergency Response Team (MDA CERT) as a fully accredited Tier II Computer Network Defense Service provider (CNDSP) in accordance with CJCSI 6510.01F and DoD O-8530.1.
- Perform CNDSP services (protect, detect, respond and sustain) for all MDA Admin/General Services, MDA Mission and test networks and enclaves 24 hours per day, seven days a week, 365 days a year.
- Conduct application testing that looks for vulnerabilities and issues using a number of tactics, technical and procedures.
- Conduct vulnerability scanning of MDA network to assess risks to MDA data from inside and outside sources.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC30 / Cyber Operations
--	---	---

- Conduct monthly information assurance vulnerability audits.
- Issue and track implementation of Information Assurance Vulnerability Alerts (IAVA), Bulletins and Technical Advisories.
- Implement Information Assurance Vulnerability Alerts (IAVA) and Communication Tasking Orders remediation and patches.
- Perform network security monitoring of all MDA subscriber networks and enclaves.
- Conduct system forensic analysis, review content of compromised system, document files and data, and identify tactics, techniques and procedures used by an attacker to gain access.
- Develop and maintain the RMF package for the BMDS Mission System to support a full Authorization to Operation (ATO).
- Compile and validate BMDS Mission Element-level certification and accreditation documents to include BMDS Element-level SIPs, DIPs, C&A Scorecards, POA&M artifacts (CVT reports IA Risk Assessments, Primary RMF artifacts).
- Interface with Central Command (CENTCOM) to provide BMDS Mission RMF package.
- Conduct an annual IA Security review of the BMDS in accordance with DoDI 8510.01 and provide an analysis of changes in IA posture.
- Collect, analyze, and report vulnerability and cyber warfare attack metrics to the MDA CIO, MDA leadership, and U.S. Cyber Command.
- Ensure MDA mission, test, and administrative systems are operated securely in accordance with DoD Information Assurance Certification and Accreditation policies.
- Prepare and maintain current certification and accreditation documentation for general service networks reported to DoD and Office of Management and Budget.

Recurring Activities for the Planning, Policy Development, Workforce Training and Force Management Accomplishment:

- Document and maintain Standard Operating Instructions/Procedures for consistent interface with the MDA BMDS Network Operations Support Center (BNOSC) and the BMDS elements.
- Publish MDA policies to incorporate new requirements stated in DoDI 8510.01 Risk Management Framework (RMF) to comply with 237 new controls and 817 control enhancements into controls validation testing of BMDS elements and networks.
- Manage the Information Assurance Workforce Improvement Program to certify Cybersecurity professionals and report compliance in accordance with Federal Information Security Management Act (FISMA) and Information Assurance Workforce Improvement Program (DoD Manual 8570.1), achieving the DoD certification goal.
- Provide Information Assurance engineering and planning guidance and vulnerability assessment for all MDA Information Technology acquisition programs.

Recurring Activities for the Continuous Monitoring Accomplishment:

- Manage data-at-rest encryption to ensure compliance with Global Information Grid mandated policies.
- Procure/renew cybersecurity software maintenance agreements for IT Security Tools.
- Procure/renew cybersecurity hardware maintenance for hardware.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Title: Information Assurance/Computer Network Defense (IA/CND)</p> <p style="text-align: right;">Articles:</p> <p>Description: Provides for the certification of Information Technology networks and systems, monitoring and computer emergency response services.</p> <p>FY 2016 Accomplishments:</p>	<p>27.194</p> <p>-</p>	<p>22.881</p> <p>-</p>	<p>0.000</p> <p>-</p>

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC30 / Cyber Operations		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
See the R2A Mission Description and Budget Item Justification for recurring FY 2016 IA/Computer Network Defense activities. FY 2017 Plans: See the R2A Mission Description and Budget Item Justification for recurring FY 2017 IA/Computer Network Defense activities. FY 2018 Plans: N/A				
Title: Detect, Analyze and Mitigate Intrusions Description: Beginning in FY 2018, this new Accomplishment will map to the Office of Management and Budget (OMB) and the Office of the Secretary of Defense (OSD) approved Cybersecurity Taxonomy. The cybersecurity activities funded within this Accomplishment include: Federal Incident Response Centers; National Institute of Standards for Technology (NIST) SP 800-37 Implementation; Cyber Threat Analysis; Cyber Continuity of Operations (COOP); Incident Response and Remediation; Forensics and Damage Assessment; and Computer Emergency Response Teams. FY 2016 Accomplishments: N/A FY 2017 Plans: N/A FY 2018 Plans: See recurring Planned Program 2018 activities in the Mission Description and Budget Item Justification.		0.000 -	0.000 -	20.100 -
Title: Preventing Malicious Activity Description: Beginning in FY 2018, this new Accomplishment will map to the Office of Management and Budget (OMB) and the Office of the Secretary of Defense (OSD) approved Cybersecurity Taxonomy. The efforts funded in this Accomplishment include: Federal Information Security Management Activity Act (FISMA)-related activities; Intrusion Prevention Systems; Trusted Internet Connections; Identity Management and Authentication; Supply Chain management; Network & Data Protection and Insider Threat Mitigation Activities. FY 2016 Accomplishments: N/A FY 2017 Plans:		0.000 -	0.000 -	13.885 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC30 / Cyber Operations		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
N/A				
<p>FY 2018 Plans: -See recurring Planned Program FY 2018 activities in the Mission Description and Budget Item Justification. -\$4.2M increase in FY2018 is for Positioning, Navigation and Timing, Last Mile Integration at Ballistic Missile Defense System (BMDS) locations.</p>				
<p>Title: Continuous Monitoring</p> <p align="right">Articles:</p>		0.000 -	0.000 -	4.827 -
<p>Description: Beginning in FY 2018, this new Accomplishment will map to the Office of Management and Budget (OMB) and the Office of the Secretary of Defense (OSD) approved Cybersecurity Taxonomy. The cybersecurity activities funded within this Accomplishment include: IT Security Tools and Other Continuous Monitoring.</p>				
<p>FY 2016 Accomplishments: N/A</p>				
<p>FY 2017 Plans: N/A</p>				
<p>FY 2018 Plans: See recurring Planned Program FY 2018 activities in the Mission Description and Budget Item Justification.</p>				
<p>Title: Planning, Policy Development, Workforce Training & Force Management</p> <p align="right">Articles:</p>		0.000 -	0.000 -	2.646 -
<p>Description: Beginning in FY 2018, this new Accomplishment will map to the Office of Management and Budget (OMB) and the Office of the Secretary of Defense (OSD) approved Cybersecurity Taxonomy. The cybersecurity activities funded within this Accomplishment include: National Initiative for Cybersecurity Education (NICE); Workforce Development; Security Training for Employees with Significant Security Responsibilities; and Cybersecurity Strategic Planning, Policy, Oversight and Management</p>				
<p>FY 2016 Accomplishments: N/A</p>				
<p>FY 2017 Plans: N/A</p>				
<p>FY 2018 Plans: See recurring Planned Program FY 2018 activities in the Mission Description and Budget Item Justification.</p>				
Accomplishments/Planned Programs Subtotals		27.194	22.881	41.458

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
0400 / 4	PE 0603890C / BMD Enabling Programs	MC30 / Cyber Operations

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC30 / Cyber Operations
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Information Assurance/Computer Network Defense (IA/CND) - BMDS IA Advisory and Assistance Services	C/CPFF	Booz Allen Hamilton : AL, CO, VA	1.271	1.679	Mar 2016	1.334	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance/Computer Network Defense (IA/CND) - CND/IA Advisory and Assistance Services	C/CPFF	Torch Technologies : AL, CO, VA	5.520	2.430	Mar 2016	2.580	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance/Computer Network Defense (IA/CND) - CND/IA Civilian Travel	Allot	MDA Civilian Travel : AL, AK, CA, CO, HI, NM, VA	0.193	0.223	Oct 2015	0.106	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance/Computer Network Defense (IA/CND) - CND/IA Civilian pay/Travel/PCS	Allot	MDA Civilian Pay : AL, CO, VA	4.842	1.850	Oct 2015	2.844	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance/Computer Network Defense (IA/CND) - CND/IA Comsec	MIPR	NSA : AL, CO, VA	0.209	0.123	Oct 2015	0.110	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance/Computer Network Defense (IA/CND) - CND/IA Licenses	C/CPAF	Northrop Grumman : AL, CO, VA	3.737	2.924	Oct 2015	5.218	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC30 / Cyber Operations
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Information Assurance/ Computer Network Defense (IA/CND) - CND/ IA Operational Support	C/FFP	Northrop Grumman : AL, CO, VA	15.731	11.294	Oct 2015	10.689	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance/ Computer Network Defense (IA/CND) - Cyber Compliance Projects	C/CPAF	Northrop Grumman : AL, CO, VA	0.000	6.671	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - A&AS Cyber IT Mgmt	C/CPFF	TEAMS, TBD : AL, CO, VA	0.000	0.000		0.000		0.164	Mar 2018	-		0.164	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - A&AS, CSM/CND	C/CPFF	TEAMS, TBD : AL, CO, VA	0.000	0.000		0.000		1.140	Mar 2018	-		1.140	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - A&AS, Cyber Risk Mgmt	C/CPFF	TEAMS, TBD : AL, CO, VA	0.000	0.000		0.000		2.856	Mar 2018	-		2.856	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - Civilian Pay	Allot	Civilian Pay : AL, CO, NM,, VA	0.000	0.000		0.000		3.255	Oct 2017	-		3.255	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - Cyber CSS	C/CPAF	IRES, TBD : AL, CO, VA	0.000	0.000		0.000		12.685	Feb 2018	-		12.685	Continuing	Continuing	Continuing
Preventing Malicious Activity - A&AS CSM/CND	C/CPFF	TEAMS, TBD : AL, CO, VA	0.000	0.000		0.000		0.570	Apr 2018	-		0.570	Continuing	Continuing	Continuing
Preventing Malicious Activity - A&AS IT Mgmt	C/CPFF	TEAMS, TBD : AL, CO, VA	0.000	0.000		0.000		0.328	Mar 2018	-		0.328	Continuing	Continuing	Continuing
Preventing Malicious Activity - Civpay	Allot	Civilian Pay : AL, CO, VA, NM	0.000	0.000		0.000		2.945	Oct 2017	-		2.945	Continuing	Continuing	Continuing
Preventing Malicious Activity - Cyber CSS	C/CPAF	IRES, TBD : AL, COL, VA	0.000	0.000		0.000		5.842	Feb 2018	-		5.842	Continuing	Continuing	Continuing
Preventing Malicious Activity - PNT Last Mile Integration Contract	C/CPAF	IRES, TBD : AL, CO, VA	0.000	0.000		0.000		4.200	Feb 2018	-		4.200	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC30 / Cyber Operations
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Continuous Monitoring - Continuous Monitoring - IT Security Tools	C/CPAF	IRES, TBD : AL, CO, VA	0.000	0.000		0.000		4.827		-		4.827	Continuing	Continuing	Continuing
Planning, Policy Development, Workforce Training & Force Management - A&AS Cyber CRM	C/CPFF	TEAMS, TBD : AL, CO, VA	0.000	0.000		0.000		0.329	Mar 2018	-		0.329	Continuing	Continuing	Continuing
Planning, Policy Development, Workforce Training & Force Management - A&AS Cyber CSM/CND	C/CPFF	TEAMS, TBD : AL, CO, VA	0.000	0.000		0.000		0.612	Mar 2018	-		0.612	Continuing	Continuing	Continuing
Planning, Policy Development, Workforce Training & Force Management - Civilian PayTravel/PCS	Allot	Civilian Pay : AL, CO, NM, VA	0.000	0.000		0.000		1.705	Oct 2017	-		1.705	Continuing	Continuing	Continuing
Subtotal			31.503	27.194		22.881		41.458		-		41.458	-	-	-

Remarks

N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	31.503	27.194	22.881	41.458	-	41.458	-	-	-

Remarks

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC30 / Cyber Operations
--	---	---

Activity Description	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Report Vulnerability and Cyber Warfare Attack Metrics to the MDA Chief Information Officer, MDA Leadership, and Cyber Command - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Monitor Networks and Systems to Defend Mission, Test, and Administrative Systems on a 24 hours per day, 7 days per week, 365 days per year basis for Information Assurance - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Provide Information Assurance Engineering and Planning Guidance and Vulnerability Assessment for Information Technology Acquisition Programs - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Procure, Implement, and Asset Control of Hardware maintenance and Software Licenses for Monitoring Systems of Information Assurance - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Conduct Information Assurance Certification Evaluation of Mission, Test, and Administrative Systems - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Complete Annual Information Assurance user Training for MDA Workforce - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Implement Information Assurance Vulnerability Alert Control Improvements for General Information Technology Services - Follow-On	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC30 / Cyber Operations
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Report Vulnerability and Cyber Warfare Attack Metrics to the MDA Chief Information Officer, MDA Leadership, and Cyber Command - Follow-On	1	2016	4	2022
Monitor Networks and Systems to Defend Mission, Test, and Administrative Systems on a 24 hours per day, 7 days per week, 365 days per year basis for Information Assurance - Follow-On	1	2016	4	2022
Provide Information Assurance Engineering and Planning Guidance and Vulnerability Assessment for Information Technology Acquisition Programs - Follow-On	1	2016	4	2022
Procure, Implement, and Asset Control of Hardware maintenance and Software Licenses for Monitoring Systems of Information Assurance - Follow-On	1	2016	4	2022
Conduct Information Assurance Certification Evaluation of Mission, Test, and Administrative Systems - Follow-On	1	2016	4	2022
Complete Annual Information Assurance user Training for MDA Workforce - Follow-On	1	2016	4	2022
Implement Information Assurance Vulnerability Alert Control Improvements for General Information Technology Services - Follow-On	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs				Project (Number/Name) MD31 / Modeling & Simulation			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD31: <i>Modeling & Simulation</i>	125.432	39.972	44.458	49.824	-	49.824	63.465	97.374	140.616	51.374	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

MDA's Modeling and Simulation (M&S) program is essential to ensuring missile defense capabilities are affordable and effective. M&S develops system-level models, frameworks, truth, simulations, and operational environments as missile defense technologies continually advance and the threat changes, and evaluates performance of the Elements, Components, and overall BMD System for verification, validation and accreditation purposes. MDA's M&S program provides a cost effective means to assess and examine the performance space of the BMDS beyond what can be physically tested under current test range conditions and within the Agency's fiscal constraints. M&S future concept simulation activities provide the capability to design and develop technologies to hedge against future missile threats. MDA's M&S systems and products provide analysis and decision-making and planning capabilities for Real-World Operations to inform the National Command Authority, Joint Staff, Military Services, NATO, Combatant Commanders (CCMDs), Operational Test Authority (OTAs), Director of Operational Test & Evaluation (DOT&E), and Allies.

The strategy of MDA's M&S Program is 1) to execute a single, integrated, and synchronized program to manage M&S development and sustainment in support of MDA's BMDS acquisition, 2) to improve BMDS Flight and Ground Test execution, 3) to leverage MDA test activities to collect data to anchor M&S, and 4) to perform warfighter training and tactics validation. The strategy also incorporates key elements to address DOT&E's BMDS Assessment Report: Ensure that future M&S architectures are composable and flexible, and simplify the integration process to conserve resources and improve capabilities; Ensure that future M&S architectures incorporate and require the use of consistent truth representations (phenomenology, lethality, environmental factors, threat simulations, etc.); Improve cross-organizational system engineering processes to optimize requirements generation and ensure the inclusion of all stakeholders; Develop refined M&S accreditation criteria between MDA and the OTA.

MDA's M&S Program consists of system and product planning, development, integration, and operation; threat model development, verification, and analysis; and integration and deployment of MDA's Distributed BMDS real-time Hardware-in-the-Loop (HWIL) and digital M&S simulation capabilities. Models and simulations are tailored to the specific needs of the Agency's test events and to match BMDS components in their various stages of development, ranging from low-to-medium fidelity analyses supporting concept definitions studies, to high-fidelity models used to support engineering level activities. MDA validates and accredits system-level models and simulations by anchoring them to ground and flight test events, per the Integrated Master Test Plan (IMTP), to enable accurate and comprehensive assessments of the BMDS.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: M&S Requirements, Design Support, Scenario Optimization	7.146	7.919	8.022
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<p>Description: This activity provides the integrated program lifecycle planning and requirements definition of all BMDS M&S models and capabilities to enable assessment of BMDS capability deliveries. M&S capability development executes an integrated, synchronized program to manage M&S development in support of BMDS development, testing, and assessment. The following actions are required on a continuing basis to accomplish the M&S lifecycle planning and requirements definition mission:</p> <ul style="list-style-type: none"> - Maintain traceability between the M&S Systems Requirements Documents and M&S product development. - Produce capability documents and specifications for M&S product development to enable BMDS flight and HWIL tests, training events, exercises, wargames, concept evaluation and development engineering. - Support MDA response to export requests for M&S software and technical data to nations or international organizations. - Participate in Technical Interchange Meetings and provide support for bilateral agreements with allies and partners. - Support system engineering capability trades for all BMDS capability deliveries (including BMDS capability deliveries for Phased Adaptive Approach and Homeland Defense). - Continue the transition to replace the Single Stimulation Framework (SSF) with the Objective Simulation Framework (OSF) to support M&S Intended Uses. - Provide integrated program lifecycle planning and scheduling of all BMDS M&S models and capabilities to enable assessment of BMDS capability deliveries for Phased Adaptive Approach (PAA) and Homeland Defense. <p>FY 2016 Accomplishments: - Conduct activities listed in Description section (SEE ABOVE).</p> <p>FY 2017 Plans: - Conduct activities listed in Description section (SEE ABOVE).</p> <p>FY 2018 Plans: - Conduct activities listed in Description section (SEE ABOVE).</p>			
<p>Title: BMDS Simulations & Tools</p> <p align="right">Articles:</p> <p>Description: This activity funds the development and sustainment of digital products and the architecture framework, and delivery/maintenance of infrastructure for BMDS performance assessments, Warfighter events, and BMD International Simulation events. The following actions are required on a continuing basis: Event Integration/Support Operations:</p> <ul style="list-style-type: none"> - Provide ground test architecture integration to meet IMTP requirements. Use the BMDS test framework to integrate distributed architectures in support of BMDS capability deployments for EPAA Phase 3. - Integrate, test, and verify the M&S enterprise supporting BMDS testing, assessment, exercises, and wargaming, including testing infrastructure. 	10.648 -	11.836 -	11.593 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>	Project (Number/Name) MD31 / <i>Modeling & Simulation</i>
--	--	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Integrate, test, functionally qualify, and deliver M&S tools and complex test architectures to provide system test capabilities to support MDA IMTP based test events, wargames, and exercises. - Continue the transition of real-time digital simulation capability to OSF to support Intended Uses. - Maintain simulations for Element M&S development laboratories used in the BMDS Integration & Development Lab and Digital M&S Integration Center (DMIC) in Huntsville, AL and in the MDIOC Simulation Center. - Conduct integration, testing and system-level verification per the digital System Requirements Document (SRD). Operate the testbed to mature the OSF-based digital system simulation. - Provide Event Integration Support for BMDS component models of PATRIOT weapon system for use in MDA test and validation events. - Provide HWIL/M&S benchmarking/integration, documentation and coordination. Sustain, integrate and execute ground tests, FAST Events and Exercises/Wargames. - Provide communications emulation (MTJ, STJ, and Link-16) and network analysis support via the Tactical Communications Environment Segment (TCES) for use in IMTP events, HWIL System Post Flight Reconstructions (SPFRs) and HWIL System Pre Mission Tests (SPMTs). - Perform operational planning for planned BMDS assessment events. - Deploy System Interface Units (SIUs) for BMDS testing. Maintain and sustain the SIU fleet, including cybersecurity, to support Developmental and Operational testing with the full BMDS to meet EPAA Phase 3 requirements. - Conduct M&S system integration and verification to support M&S system architecture development. Conduct developmental integration testing. <p>M&S Operations:</p> <ul style="list-style-type: none"> - Provide digital representations of BMDS elements/components using MDA's BMD International Simulation (I-SIM) in support of CCMD and International Wargames, conceptual planning, BMD visualizations, BMD training/orientation, M&S demonstrations, and the Warfighter's Modification & Fielding Requirements List (MFRL) for exercises and training. - Implement I-SIM re-architecture requirements and emerging requirements such as IAMD/Fog of War to adapt to growing distributed event requirements. - Maintain the Missile Defense Space Warning Tool (MDST) to keep pace with fielded BMDS Overhead Persistent Infrared (OPIR) Architectures in support of Warfighter training events, BMDS exercise events, and BMDS development engineering. - Provide software operations/maintenance support to the Extended Air Defense Simulation (EADSIM) code base for use in Warfighter exercises, training venues, and CCMD planning tools. - Upgrade legacy models and develop new designs or software as required to support BMDS simulation Re-Architecture. - Provide threat representations (kinematic trajectories, radar cross sections, and infrared signatures data) for use in real-world events, simulations, exercises, wargames, and test and evaluation activities across the DoD. <p>Note: this accomplishment was renamed from M&S Digital Framework, Simulation, Models to reduce confusion between similarly named accomplishments.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (SEE ABOVE). - Provide Integrated Threat Packages of red-force representations (kinematic trajectories, radar cross sections, and infrared signature data) for use in BMDS Ground Test events only. - Begin transition off of Discrete Event Simulation (DESIM). 			
--	--	--	--

Title: M&S Objective Simulation Framework (OSF)	12.508	13.948	14.049
--	--------	--------	--------

<p>Description: The following actions are required on a continuing basis to accomplish the OSF mission:</p> <ul style="list-style-type: none"> - Develop and implement OSF upgrades to incorporate advanced tracking, discrimination, engagement and associated upper tier debris mitigation capabilities, as well as other requirements and capabilities to meet MDA's evolving M&S Enterprise needs. - Sustain and enhance framework products to maintain capabilities to support stakeholders. - Develop plans, procedures and documentation for scheduled events including Wargames and Combatant Command Exercises and the Distributed, Focused and Integrated HWIL Events as presented in the IMTP. Provide event architecture integration and checkout of Wargames for these same IMTP scheduled events. - Provide the ground test architecture integration expertise to meet the testing requirements of the IMTP. Support delivery of integrated architectures for test across all test venues using the BMDS test framework to integrate distributed architectures in support of BMDS. - Develop, maintain, test, field, and operate model representations for use in events and other MDA M&S stakeholder application areas. Deploy hardware and software updates to distributed sites. Perform regular maintenance and critical repairs of hardware and software. - Support MDA's Experimental End-to-end Digital Integrated System-level Simulation (X-EDISS) requirements, referred to Tier 2 Digital in previous reports, including hardware and software, data storage and transmission, and verification tools. - Contro and maintain the M&S Integration and Development Laboratories for Element M&S. Maintain venue for stakeholders to conduct early integration efforts and identification of issues prior to event architecture integration to support system development. - Deploy System Interface Units (SIUs) for BMDS testing - materials, licenses, SIU fleet purchasing. Deploy SIUs and components to maintain and sustain SIU fleet including cybersecurity; enables Developmental and Operational testing with full BMDS as required in IMTP. - Continue maintenance of SSF in the required venues until the transition to OSF in the venues completes. 	Articles:	-	-	-
--	------------------	---	---	---

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	---------	---------	---------

Note: this accomplishment was renamed from M&S HWIL Framework, Simulations, Models to reduce confusion between similarly named accomplishments.

- FY 2016 Accomplishments:**
- Conduct activities listed in Description section (SEE ABOVE).
- FY 2017 Plans:**
- Conduct activities listed in Description section (SEE ABOVE).
- FY 2018 Plans:**
- Conduct activities listed in Description section (SEE ABOVE).

Title: M&S Core Truth Modeling	9.670	10.755	10.840
---------------------------------------	-------	--------	--------

<p align="right">Articles:</p> <p>Description: The Core Truth Model (CTM) program provides consistent and common Phenomenology, Lethality, Environment, Communications, and Threat models for BMDS M&S venues utilized in all Digital and Ground Test Events and Wargaming Exercises. The CTM efforts are critical in the assessment of all BMDS capability deliveries. The following actions are required on a continuing basis to accomplish the CTM mission:</p> <ul style="list-style-type: none"> - Implement next generation truth representations for signatures and lethality to address advanced BMDS capability needs for tracking, discrimination and engagement - Maintain legacy truth representations (e.g., Parametric Endoatmospheric-Exoatmospheric Lethality Simulation (PEELS), Kinetic Intercept Debris Distribution (KIDD) and Optical Signatures Code/Optical Signature Inline Generator (OSC/OPTISIG)) until fully transitioned. - Support integration of all applicable CTM functions into the OSF framework. - Provided support for scheduled events including training, exercises, Wargames, and the Distributed, Focused and Integrated HWIL Events as presented in the IMTP. - Deliver CTM Toolkit for integrated truth representations across the M&S enterprise. - Continue re-establishment of the Environments Program that will provide consistent environment models for system and element level simulations. - Continue development of Truth Interaction which includes infrared (IR) propagation and radio frequency (RF) propagation,. This will provide consistent models and truth to system and element level simulations. - Generate CTM Sensitivity analysis to identify the sensitivity within system simulation of Core Truth Models and boundary. - Develop and maintain CTM design to support system and element level simulations. 	-	-	-
---	---	---	---

FY 2016 Accomplishments:

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017
<p>- Conduct activities listed in Description section (SEE ABOVE).</p> <p>FY 2017 Plans:</p> <p>- Conduct activities listed in Description section (SEE ABOVE).</p> <p>- Identify SBIR Technology to be transitioned to core program in support of increasing capabilities across the CTM areas.</p> <p>FY 2018 Plans:</p> <p>- Conduct activities listed in Description section (SEE ABOVE).</p>			
<p>Title: M&S Improvements</p> <p align="right">Articles:</p> <p>Description: This effort funds M&S improvements that will provide enhancements to digital and ground test capabilities. Planned improvements include an experimental, developmental M&S prototype capability necessary to achieve an SRD-compliant End-to-end Digital Integrated System-level Simulation (EDISS). The X-EDISS effort designs and develops an integrated high-fidelity digital simulation capability that will provide assessment data for the BMDS, supplemental to Ground Test and Flight Test, and in areas that those venues cannot address, and with statistically significant numbers of runs. X-EDISS provides a capability to supplement and eventually replace current stand-alone/sequential approach to digital predictive pre-mission analysis of MDA flight tests.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans: This effort is a follow-on to planning and design efforts begun in FY 2016-2017. FY 2018 increase is due to additional MDA focus on improvement of M&S digital capability to support Technical Capability Declarations.</p> <p>- Design and develop prototype, including hardware for development and execution platforms, of enterprise-wide digital interface and new functionality in time-management and modeling of simulated BMDS communications, based on FY 2017 government/CSS design work.</p>		0.000 -	0.000 -
		5.320 -	-
Accomplishments/Planned Programs Subtotals		39.972	44.458
		49.824	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603881C: <i>Ballistic Missile</i>	197.617	209.072	230.162	-	230.162	194.328	253.778	264.377	267.254	Continuing	Continuing
<i>Defense Terminal Defense Segment</i>											
• 0603882C: <i>Ballistic</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
<i>Missile Defense Midcourse</i>											
<i>Defense Segment</i>											
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing

Remarks

D. Acquisition Strategy

The M&S acquisition strategy utilizes full and open competition to develop, acquire and deliver the integrated architectures/frameworks while the Elements, using the same open competition methods, develop and deliver models of their systems. The Digital and HWIL product centers integrate the suite of M&S into a composite simulation capability, all based on an open architecture. M&S achieves this end-state via close collaboration between its integrating contractor teams (Digital and HWIL) and those of the Element prime contractors, with additional technical standards and engineering oversight provided by FFRDCs and UARCs.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
M&S Requirements, Design Support, Scenario Optimization - FFRDC & UARC	MIPR	Various : CO, AL	1.460	1.404	Nov 2015	1.728	Nov 2016	1.632	Nov 2017	-		1.632	Continuing	Continuing	Continuing
M&S Requirements, Design Support, Scenario Optimization - Prior Yr Requirements & Scenario Design no longer funded in FYDP	Various	Various : AL	1.933	0.000		0.000		0.000		-		0.000	0	1.933	0
M&S Requirements, Design Support, Scenario Optimization - Requirements & Design - CSS 2	C/CPFF	MiDAESS / TEAMS : CO	5.375	5.012	Nov 2015	5.433	Nov 2016	6.390	Nov 2017	-		6.390	Continuing	Continuing	Continuing
M&S Requirements, Design Support, Scenario Optimization - Requirements & Design - OGA	MIPR	SMDC : AL	0.476	0.456	Nov 2015	0.482	Nov 2016	0.000		-		0.000	0	1.414	0
M&S Requirements, Design Support, Scenario Optimization - Requirements & Design Support	Various	MDA : CO, AL	4.236	0.274	Oct 2015	0.276	Nov 2016	0.000		-		0.000	0	4.786	0
BMD Simulations & Tools - Digital Framework Development	C/CPAF	Northrop Grumman : CO	10.095	5.067	Oct 2015	4.720	Nov 2016	6.884	Nov 2017	-		6.884	Continuing	Continuing	Continuing
BMD Simulations & Tools - Digital Simulation Development / Support	MIPR	SMDC : AL	2.623	0.924	Oct 2015	0.000		0.000		-		0.000	0	3.547	0
BMD Simulations & Tools - M&S / Digital Framework Support	Various	MDA : CO, AL	1.114	0.551	Oct 2015	0.895	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
BMDS Simulations & Tools - M&S / Digital Framework Support - CSS	C/CPFF	MiDAESS / TEAMS : CO	0.000	0.000		2.000	Nov 2016	1.300	Nov 2017	-		1.300	Continuing	Continuing	Continuing
BMDS Simulations & Tools - M&S / Digital Framework Support - Industry	C/CPFF	TBE : AL	0.000	0.000		0.959	Nov 2016	0.891	Nov 2017	-		0.891	Continuing	Continuing	Continuing
BMDS Simulations & Tools - M&S / Digital Framework Support - OGA	MIPR	AMRDEC : AL	6.573	4.106	Oct 2015	3.262	Nov 2016	2.518	Nov 2017	-		2.518	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - M&S HWIL - CSS	C/CPFF	MiDAESS / TEAMS : CO	0.000	0.000		2.200	Nov 2016	0.800	Nov 2017	-		0.800	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - M&S HWIL - Industry	C/CPAF	Northrop Grumman : CO	2.608	2.962	Oct 2015	0.620	Nov 2016	0.350	Nov 2017	-		0.350	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - M&S HWIL Framework Development and Support	C/CPFF	Teledyne Brown Engineering : AL, CO	11.717	3.928	Oct 2015	3.405	Nov 2016	9.434	Nov 2017	-		9.434	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - M&S HWIL Simulations / Models Development	MIPR	AMRDEC : AL	14.741	4.457	Oct 2015	4.411	Nov 2016	0.550	Nov 2017	-		0.550	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - M&S HWIL Support / GT re-architecture	Various	MDA : AL, CO	1.908	1.161	Oct 2015	3.312	Nov 2016	2.915	Nov 2017	-		2.915	Continuing	Continuing	Continuing
M&S Core Truth Modeling - M&S Core Truth Modeling - OGA	MIPR	AFRL : CO	0.000	0.000		1.300	Nov 2016	1.400	Nov 2017	-		1.400	Continuing	Continuing	Continuing
M&S Core Truth Modeling - Core Truth Models Validation	Various	MDA : CO, AL	5.047	0.597	Oct 2015	0.500	Oct 2016	1.000	Nov 2017	-		1.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
M&S Core Truth Modeling - M&S Core Truth Modeling - CSS	C/CPFF	Peopletec : AL, CO	0.000	0.000		0.000		1.591	Nov 2017	-		1.591	Continuing	Continuing	Continuing
M&S Core Truth Modeling - M&S Core Truth Modeling - Lethality/ Phenomenology Modeling	MIPR	AMRDEC : AL	27.565	2.437	Oct 2015	2.400	Nov 2016	1.310		-		1.310	Continuing	Continuing	Continuing
M&S Core Truth Modeling - M&S Core Truth Modeling Simulation System	C/CPAF	Northrop Grumman : CO	27.961	6.636	Oct 2015	6.555	Nov 2016	5.539	Nov 2017	-		5.539	Continuing	Continuing	Continuing
M&S Improvements - M&S Improvement - X-EDISS	Various	Various : CO, AL	0.000	0.000		0.000		5.320	Dec 2017	-		5.320	Continuing	Continuing	Continuing
Subtotal			125.432	39.972		44.458		49.824		-		49.824	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	125.432	39.972		44.458		49.824		-		49.824	-	-	-

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

Activity	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
International Simulation v.8.3 – 1Q-FY 2016	▲													
Missile Defense Space Warning Tool (MDST) v16.1 - 1Q-FY 2016	▲													
CTV-02 HWIL System Pre-Mission Test (SPMT)	▲													
Flight Test Operational (FTO) 02 E1a Count Down Exercise	▲													
Ground Test, Distributed 06 Part 1 (GTD-06 Part 1)	▲													
Combatant Command Exercise (Keen Edge 16)		▲												
Release Update to Objective Simulation Framework (OSF) - 3Q-FY 2016			▲											
Flight Test, Operational (FTO) 02 E2a HWIL System Post Flight Reconstruction (SPFR)			▲											
Ground Test, Integrated 06 Part 2 (GTI-06 Part 2)			▲											
Ground Test, Integrated ISR 16			▲											
Ground Test, Distributed 06 Part 2 (GTD-06 Part 2)				▲										
Flight Test Operational (FTO) 02 E1a System Post Flight Reconstruction (SPFR)				▲										
International Simulation v 8.4 – 1Q-FY 2017					△									
Missile Defense Space warning Tool (MDST) v16.2 - 1Q-FY 2017					△									
Objective Simulation Framework (OSF) v1.0.4.x - 1Q FY 2017					△									
(EX) Global Lightning 17					◇	◇								
FTG-15 (GM Intercept Flight Test) HWIL System Post Flight Reconstruction (SPFR)						△								
FTM-29 (AEGIS 5.1 Intercept Flight Test) HWIL System Pre-Mission Test (SPMT)						△								
Single Stimulation Framework (SSF) 1.1.7.Z						△								
(EX) KEEN Sword 17							◇	◇	◇					
(WG) Multi-National Missile Defense Conference (MNC) 17								◇	◇					
Release Update to OSF - FY 2018										△				
MDST v16.3										△				
International Simulation v8.5										△				

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022			
FTG-11 HWIL System Pre-Mission Test (SPMT)								△														
FTG-11 Count Down Exercise									△													
International Simulation v8.6										△												
Release Update to OSF - FY 2019										△												
GTI-07b (N/P) (BMDS Ground Test)										◇												
GTD-07b (N/P) (BMDS Ground Test)											◇	◇										
International Simulation v8.7													△									
GTX-08 Part 2													△									
Release Update to OSF - 2Q FY 2020														△								
GTI-08 (N/P)(BMDS Ground Test)														◇	◇							
GTD-08 (E/C) (BMDS Ground Test)															◇	◇						
Release Update to OSF - FY 2021																			△			
GTD-08 (N/P) (BMDS Ground Test)																			◇			
International Simulation v8.8 - 1Q-FY 2021																			△			
GTX-09																					△	
Release Update to OSF - FY 2022																						△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD31 / Modeling & Simulation
--	---	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
International Simulation v.8.3 1Q-FY 2016	1	2016	1	2016
Missile Defense Space Warning Tool (MDST) v16.1 - 1Q-FY 2016	1	2016	1	2016
CTV-02 HWIL System Pre-Mission Test (SPMT)	1	2016	1	2016
Flight Test Operational (FTO) 02 E1a Count Down Exercise	1	2016	1	2016
Ground Test, Distributed 06 Part 1 (GTD-06 Part 1)	1	2016	1	2016
Combatant Command Exercise (Keen Edge 16)	2	2016	2	2016
Release Update to Objective Simulation Framework (OSF) - 3Q-FY 2016	3	2016	3	2016
Flight Test, Operational (FTO) 02 E2a HWIL System Post Flight Reconstruction (SPFR)	3	2016	3	2016
Ground Test, Integrated 06 Part 2 (GTI-06 Part 2)	3	2016	3	2016
Ground Test, Integrated ISR 16	3	2016	3	2016
Ground Test, Distributed 06 Part 2 (GTD-06 Part 2)	4	2016	4	2016
Flight Test Operational (FTO) 02 E1a System Post Flight Reconstruction (SPFR)	4	2016	4	2016
International Simulation v 8.4 1Q-FY 2017	1	2017	1	2017
Missile Defense Space warning Tool (MDST) v16.2 - 1Q-FY 2017	1	2017	1	2017
Objective Simulation Framework (OSF) v1.0.4.x - 1Q FY 2017	1	2017	1	2017
(EX) Global Lightning 17	1	2017	2	2017
FTG-15 (GM Intercept Flight Test) HWIL System Post Flight Reconstruction (SPFR)	3	2017	3	2017
FTM-29 (AEGIS 5.1 Intercept Flight Test) HWIL System Pre-Mission Test (SPMT)	3	2017	3	2017
Single Stimulation Framework (SSF) 1.1.7.Z	3	2017	3	2017
(EX) KEEN Sword 17	3	2017	1	2018
(WG) Multi-National Missile Defense Conference (MNC) 17	4	2017	1	2018
Release Update to OSF - FY 2018	1	2018	1	2018
MDST v16.3	1	2018	1	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / <i>BMD Enabling Programs</i>	Project (Number/Name) MD31 / <i>Modeling & Simulation</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
International Simulation v8.5	1	2018	1	2018
FTG-11 HWIL System Pre-Mission Test (SPMT)	2	2018	2	2018
FTG-11 Count Down Exercise	4	2018	4	2018
International Simulation v8.6	1	2019	1	2019
Release Update to OSF - FY 2019	1	2019	1	2019
GTI-07b (N/P) (BMDS Ground Test)	1	2019	1	2019
GTD-07b (N/P) (BMDS Ground Test)	3	2019	4	2019
International Simulation v8.7	1	2020	1	2020
GTX-08 Part 2	1	2020	1	2020
Release Update to OSF - 2Q FY 2020	2	2020	2	2020
GTI-08 (N/P)(BMDS Ground Test)	2	2020	3	2020
GTD-08 (E/C) (BMDS Ground Test)	3	2020	4	2020
Release Update to OSF - FY 2021	1	2021	1	2021
GTD-08 (N/P) (BMDS Ground Test)	1	2021	1	2021
International Simulation v8.8 - 1Q-FY 2021	1	2021	1	2021
GTX-09	4	2021	4	2021
Release Update to OSF - FY 2022	1	2022	1	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC31 / Engineering Cyber Operations
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC31: <i>Engineering Cyber Operations</i>	0.204	0.613	0.253	3.838	-	3.838	6.500	13.308	34.988	13.448	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 increase is to fund additional cybersecurity support needed to ensure BMDS networks and MDA Engineering content on external networks is protected, and to monitor those networks in accordance with DoD mandates.

A. Mission Description and Budget Item Justification

This project supports the monitoring and tracking of Cybersecurity mitigations detailed in Information Technology security POAMs. Activities include preparation of certification and accreditation documentation and accreditation recommendations to the MDA Senior Information Assurance Officer (SIAO)/Certification Authority (CA) and DAA. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act.

This project implements Risk Management Framework (RMF) system engineering principles as specified within DOD 8510.01 to acquire, design, test, implement and field technical solutions throughout the systems architecture to ensure sufficient protections exist from a threat and risk based approach. MDA's goal is to ensure Cybersecurity engineering principles flow into system requirements and design specifications early to provide the most cost benefit and ensure security controls are aligned with the National Institute of Standards and Technology (NIST) 800-53a security controls as applicable to systems categorized as National Security Systems.

This project includes funding to conduct an MDA Insider threat program to identify, deter, and mitigate potential insider threats. This activity is Presidentially and DoD-mandated.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Information Assurance / Cyber Network Defense	0.613	0.253	3.838
Articles:	-	-	-
Description: This activity funds network defense and Information System Security Manager (ISSM) activities for MDA Engineering. Specific tasks include:			
- Conduct Cybersecurity/information assurance engineering and architecture planning for Engineering information technology systems.			
- Plan and test the information assurance controls for Engineering systems.			
- Implement RMF system engineering principles to ensure sufficient protections exist from a threat and risk based approach			
- Conduct Controls Validation Testing of systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC31 / Engineering Cyber Operations

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Conduct annual information assurance reviews to assess compliance in implementing and maintaining information assurance controls. - Perform cybersecurity upgrades as needed to MDA Engineering systems to be in compliance with DoD mandates.			
<i>FY 2016 Accomplishments:</i>			
- Conduct activities listed in Description section (SEE ABOVE).			
<i>FY 2017 Plans:</i>			
- Conduct activities listed in Description section (SEE ABOVE).			
<i>FY 2018 Plans:</i>			
FY 2018 increase is to fund additional cybersecurity support needed to ensure BMDS networks and MDA Engineering content on external networks is protected, and to monitor those networks in accordance with DoD mandates. Also beginning in FY 2018, funding for MDA Insider Threat mitigation has been transferred to this project from project MD28, Intelligence and Security. - Conduct activities listed in Description section (SEE ABOVE). - Augment Insider Threat mitigation capabilities, including enhancements for defense of IT systems. - Complete upgrades to MDA Engineering networks, including the Threat Modeling Center network and the BMDS I-SIM development network.			
Accomplishments/Planned Programs Subtotals	0.613	0.253	3.838

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0305103C: <i>Cyber Security Initiative</i>	0.941	0.969	0.986	-	0.986	0.997	1.031	1.051	1.073	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC31 / Engineering Cyber Operations
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Information Assurance / Cyber Network Defense - Cybersecurity Upgrades	C/CPAF	Northrop Grumman : CO	0.000	0.000		0.000		1.150	Dec 2017	-		1.150	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - IT / Cybersecurity Support	C/CPFF	MiDAESS / TEAMS : CO, AL, VA	0.204	0.613	Nov 2015	0.253	Nov 2016	1.559	Nov 2017	-		1.559	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Insider Threat Mitigation Cell IT Network Defense	Various	MDA : Various	0.000	0.000		0.000		1.129	Dec 2017	-		1.129	Continuing	Continuing	Continuing
Subtotal			0.204	0.613		0.253		3.838		-		3.838	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.204	0.613	0.253	3.838	-	3.838	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4 **R-1 Program Element (Number/Name)** PE 0603890C / BMD Enabling Programs **Project (Number/Name)** MC31 / Engineering Cyber Operations

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆			
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇			
MC31 M&S Cyber Operations	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
	◇ ◇ ◇ ◇	◇ ◇ ◇ ◇	◇ ◇ ◇ ◇	◇ ◇ ◇ ◇	◇ ◇ ◇ ◇	◇ ◇ ◇ ◇	◇ ◇ ◇ ◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MC31 / Engineering Cyber Operations
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC31 M&S Cyber Operations	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs				Project (Number/Name) MD32 / Quality, Safety, and Mission Assurance			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD32: <i>Quality, Safety, and Mission Assurance</i>	177.382	28.864	31.022	30.516	-	30.516	29.796	31.387	31.901	32.550	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Quality, Safety, and Mission Assurance verifies that all systems are functioning and tracking against actual verified targets and that all associated processes and procedures are strictly followed.

Quality: Provides on-site Quality Assurance (QA) inspection for all ground and flight tests to ensure that all processes and procedures are adhered to and no short cuts or deviations occur. Quality management system audits are performed on the sub tier supply chain to determine adequacy of contractor requirement flow down and sub tier supplier compliance to industry standards. Quality Subject Matter Experts (SMEs) attend BMDS configuration control boards to ensure quality is implemented across all Programs. Provides quality on-site formal inspection and resolution when troubled suppliers are identified and also initiates and leads on-site Joint Government and Industry Team field support and expertise to assist when critical sole source suppliers are failing. Conducts initiatives to revamp sole source suppliers by assisting them to get healthy and perform at world class levels, establishes consistent acquisition and award fee contractual requirements to ensure that a strategic approach is applied to all mission critical systems and maintains MDA Assurance Provisions for the Agency.

Safety: Responsible for system safety of the BMDS and for the Safety and Occupational Health of personnel located in the National Capital Region (NCR); Huntsville, Alabama; Fort Greely, Alaska; Vandenberg Air Force Base (VAFB), California; and, Dahlgren, VA. Additionally responsible for ensuring the overall safety of the civilian, contractor and military workforce. BMDS Safety Officers (BSOs) provide on-site support 24 hours a day, 365 days a year to ensure operational safety of systems.

Mission Assurance: Provides in-plant MDA Assurance Representatives (MARs) for the MDA at government and contractor facilities. MARs are Government Mission Assurance and Quality experts who provide quality and technical oversight of contractor manufacturing. Mission Assurance Audits are conducted which focus on design margin, the effectiveness of acceptance testing and the sufficiency of manufacturing processes. Audits are performed for contractual requirements, internal requirements, and industry best practices. These audits are one of MDA's most effective methods of enabling change among the MDA contractors and suppliers. Quality, Safety, and Assurance provides Subject Matter Experts (SMEs) who attend all technical reviews (i.e. Design, Test, Mission Readiness Reviews, and Failure Review Boards) to ensure mission assurance principles are consistently implemented across the Ballistic Missile Defense System (BMDS). Quality, Safety, and Mission Assurance develops overarching design and quality standards such as the MDA Assurance Provisions (MAP) for MDA which enhances BMDS reliability. Hardware acceptance reviews and pedigree documentation reviews are performed to ensure all manufacturing rework and repair is performed within approved processes.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD32 / Quality, Safety, and Mission Assurance

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Title: Quality, Safety & Mission Assurance</p> <p align="right">Articles:</p> <p>Description: Quality, Safety, and Mission Assurance verifies that all systems are functioning and tracking against actual verified targets and that all associated processes and procedures are strictly followed.</p> <p>FY 2016 Accomplishments: SEE ABOVE Description</p> <p>FY 2017 Plans: SEE ABOVE Description</p> <p>FY 2018 Plans: SEE ABOVE Description</p>	28.864	31.022	30.516
Articles:	-	-	-
Accomplishments/Planned Programs Subtotals	28.864	31.022	30.516

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Quality, Safety and Mission Assurance program is a collaboration between subject matter expertise in the Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), Contract Support Services (CSS), and Industry.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD32 / Quality, Safety, and Mission Assurance
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks

N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Quality, Safety & Mission Assurance - Agency Safety & Occupational Health	C/CPFF	Various Multi : AL, CO, AK, DC	2.067	0.260	Oct 2015	0.266	Dec 2016	0.260	Dec 2017	-		0.260	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Audits & Quality On-site Support	MIPR	NSWC Corona : AL, CA	16.839	3.000	Oct 2015	3.338	Dec 2016	3.316	Dec 2017	-		3.316	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - BMDS Mission Assurance Agency Operations	C/CPFF	AI Solutions : AL	6.547	1.198	Oct 2015	1.009	Dec 2016	1.100	Dec 2017	-		1.100	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - BMDS Quality Support	C/CPFF	AI Solutions : AL	6.597	1.300	Oct 2015	1.710	Dec 2016	1.500	Dec 2017	-		1.500	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - BMDS Safety	C/CPFF	APT, INC : AL	8.448	1.180	Oct 2015	1.208	Dec 2016	1.200	Dec 2017	-		1.200	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - BMDS Safety Officers	MIPR	AMRDEC : AL	3.698	0.318	Oct 2015	0.281	Dec 2016	0.300	Dec 2017	-		0.300	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - HQ & Core Management	MIPR	AMRDEC : AL	2.150	0.300	Oct 2015	0.300	Dec 2016	0.275	Dec 2017	-		0.275	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - In-Plant Quality Support (MARS)	C/CPFF	Various Multi : AL, AK, AZ, CA, CO, FL,	10.071	1.355	Oct 2015	1.413	Dec 2016	1.415	Dec 2017	-		1.415	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD32 / Quality, Safety, and Mission Assurance
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		HI, NJ, MA, MO, MD, UT													
Quality, Safety & Mission Assurance - Independent Readiness Review Team	C/CPFF	AI Solutions : AL	4.269	0.540	Oct 2015	0.550	Dec 2016	0.540	Dec 2017	-		0.540	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance Subject Matter Experts	C/CPFF	APT, INC. : AL	6.590	0.522	Oct 2015	0.531	Dec 2016	0.520	Dec 2017	-		0.520	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Operations Support	MIPR	Various Multi : AL, CA	4.609	0.200	Oct 2015	0.200	Dec 2016	0.200	Dec 2017	-		0.200	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Parts, Materials and Processes (PMP) Program	MIPR	Various Multi : AL, CA, IN	9.865	2.155	Oct 2015	2.015	Dec 2016	1.961	Dec 2017	-		1.961	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Parts, Materials and Processes - PMP - Program	C/CPFF	APT, INC : AL	3.445	0.641	Oct 2015	0.600	Dec 2016	0.600	Dec 2017	-		0.600	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Pedigree & Design Certification - FFRDC	MIPR	Aerospace : AL, CA	18.067	3.000	Oct 2015	3.000	Dec 2016	3.000	Dec 2017	-		3.000	Continuing	Continuing	Continuing
Subtotal			103.262	15.969		16.421		16.187		-		16.187	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD32 / Quality, Safety, and Mission Assurance
--	---	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Quality, Safety & Mission Assurance - Quality, Safety & Mission Assurance HQ & Core Management (MDA CIV)	Allot	MDA QS : AL, VA, MD, CA, AZ, HI, AK, MA, NJ, FL, AR, UT	52.749	11.117	Oct 2015	11.751	Oct 2016	11.794	Oct 2017	-		11.794	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Quality, Safety & Mission Assurance Operations Support	C/CPFF	MDA QS : AL, DC, VA	7.715	0.818	Oct 2015	1.527	Nov 2016	1.345	Nov 2017	-		1.345	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Quality, Safety & Mission Assurance Operations Support (Travel/PCS)	Allot	MDA QS : AL, CO, AK, DC, VA	13.656	0.960	Oct 2015	1.323	Nov 2016	1.190	Nov 2017	-		1.190	Continuing	Continuing	Continuing
Subtotal			74.120	12.895		14.601		14.329		-		14.329	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	177.382	28.864	31.022	30.516	-	30.516	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency							Date: May 2017			
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs			Project (Number/Name) MD32 / Quality, Safety, and Mission Assurance				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017													
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs						Project (Number/Name) MD32 / Quality, Safety, and Mission Assurance							
Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇	
						FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
MD32 Quality, Safety, and Mission Assurance						◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD32 / Quality, Safety, and Mission Assurance

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD32 Quality, Safety, and Mission Assurance	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs				Project (Number/Name) MD40 / Program-Wide Support			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: Program-Wide Support	106.856	17.722	18.483	21.474	-	21.474	23.387	26.227	29.605	25.520	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016, Program Wide Support (PWS) reflects a proportional change as a result of decreases in BMD Enabling Programs and in FY 2017 PWS reflects a proportional change as a result of increases in BMD Enabling Programs. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts and Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA-wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	17.722	18.483	21.474
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	17.722	18.483	21.474

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance (MIPR)	MIPR	Various Multi: AL, CO, CA, VA etc.	8.123	6.481	Jan 2016	7.063	Jan 2017	4.299	Jan 2018	-		4.299	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various: Multi: AL, CA, CO, VA	5.416	0.000		0.236	Jul 2017	0.429	Jul 2018	-		0.429	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations User Services	C/CPAF	Various: Multi: AL, CO, NM, VA, various	5.602	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	MDA: AK, AL, CA, CO, VA	32.108	0.000		0.000		0.000		-		0.000	32.378	64.486	0
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various: Multi: AL, CO, CA, VA	55.607	10.436	Nov 2015	10.253	Nov 2016	16.746	Nov 2017	-		16.746	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Various: Multi: AK, AL, CA, CO, VA	0.000	0.805	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services MIPRs	MIPR	Various: Multi: AK, AL, CO, CA, HI, MD, VA, NJ, NY, OCONUS	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - FFRDC	C/CPFF	JHU: CA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Facilities and Maintenance SRM	MIPR	Various: Multi: AL, CA, AL, AK	0.000	0.000		0.931	Jul 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			106.856	17.722		18.483		21.474		-		21.474	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	106.856	17.722	18.483	21.474	-	21.474	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
MD40 Program-Wide Support	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / BMD Enabling Programs	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603891C / <i>Special Programs - MDA</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1,090.278	390.264	323.607	320.190	-	320.190	273.713	254.407	265.119	270.417	Continuing	Continuing
MD27: <i>Special Programs</i>	1,090.278	390.264	323.607	320.190	-	320.190	273.713	254.407	265.119	270.417	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	400.387	321.607	307.410	-	307.410
Current President's Budget	390.264	323.607	320.190	-	320.190
Total Adjustments	-10.123	2.000	12.780	-	12.780
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.994	0.000			
• SBIR/STTR Transfer	-9.129	0.000			
• Other Adjustment	0.000	2.000	12.780	-	12.780

Change Summary Explanation

FY 2016 to FY 2017 decrease reflects completion of work. Further details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

The increase in FY2018 from PB17 to PB18 reflect realignment to Department of Defense priorities. Further details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

FY 2017 Amended Budget Request Justification: \$+2.000M is required to address emergency warfighting readiness requirements to ensure readiness of the BMDS.

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	4,739.838	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
MD09: <i>Aegis BMD</i>	4,510.326	686.536	846.028	292.063	-	292.063	285.018	356.447	324.925	332.936	Continuing	Continuing
MG09: <i>Aegis BMD SM-3 Development Articles</i>	-	0.000	0.000	253.276	-	253.276	166.129	73.523	18.291	0.000	0	511.219
MM09: <i>Aegis BMD SM-3 Development</i>	-	0.000	0.000	93.414	-	93.414	121.268	125.305	74.922	111.278	0	526.187
MC09: <i>Cyber Operations</i>	1.700	1.225	0.879	2.340	-	2.340	14.970	22.506	23.079	20.177	Continuing	Continuing
MX09: <i>Aegis BMD Development Support</i>	32.016	80.312	68.283	169.325	-	169.325	177.360	174.101	182.794	197.100	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	195.796	36.138	43.876	41.634	-	41.634	40.306	37.335	32.153	33.815	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Decrease from FY 2017 to FY 2018 is due to completion of Aegis Ballistic Missile Defense (BMD) 5.x Development functionality implementation, baseline certification testing and life cycle evolution as the program prepares to shift from development to the production phase.

A. Mission Description and Budget Item Justification

The Aegis BMD mission is to deliver an enduring, operationally effective and supportable BMD capability to defend the nation, deployed forces, friends and allies, and to increase this capability by delivering evolutionary improvements as part of Ballistic Missile Defense System (BMDS) upgrades. The Aegis BMD element of the BMDS capitalizes upon and evolves from the existing United States Navy Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures. Aegis BMD provides a forward-deployable, mobile capability to detect and track Ballistic Missiles of all ranges, and the ability to destroy Short-Range Ballistic Missiles (SRBMs), Medium-Range Ballistic Missiles (MRBMs), and Intermediate-Range Ballistic Missiles (IRBMs) in the midcourse phase of flight, and shorter range missiles in the terminal phase of flight. Aegis BMD also provides a Long Range Surveillance and Track (LRS&T) capability to the BMDS. Upgrades to both the Aegis BMD Weapon System and the Standard Missile-3 (SM-3) configuration enable Aegis BMD to provide effective, supportable defensive capability against longer range, more sophisticated threats and an enduring Aegis Ashore defensive capability.

This Program Element includes BMDS threat discrimination improvements, which will enhance BMDS effectiveness against the evolving adversary threat. The result will be a BMDS architecture more capable of discriminating and destroying reentry vehicles with a higher degree of confidence, improving Warfighter shot doctrine, and more efficiently using interceptor inventory. BMDS threat discrimination improvements are funded from the Enabling (0603890C), Midcourse (0603882C), BMD Sensors (0603884C), C2BMC (0603896C), and Aegis BMD (0603892C) PEs.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD
---	---

This Program Element also investigates concepts and performs systems engineering to address hypersonic threats.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	830.647	959.066	841.738	-	841.738
Current President's Budget	804.211	959.066	852.052	-	852.052
Total Adjustments	-26.436	0.000	10.314	-	10.314
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-9.994	0.000			
• SBIR/STTR Transfer	-16.442	0.000			
• Other Adjustment	0.000	0.000	10.314	-	10.314

Change Summary Explanation

The increase in FY2018 from PB17 to PB18 is for completion of SM-3 Block IIA development efforts, which is offset by implementation of reduced contract spending for Mission Support Services in accordance with Department Service Requirement Review Board reductions through increased competition.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD09: <i>Aegis BMD</i>	4,510.326	686.536	846.028	292.063	-	292.063	285.018	356.447	324.925	332.936	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease FY 2017 to FY 2018 due to continued completion of SM-3 Block IIA development efforts; and completion of 5.x development functionality implementation and completion of Baseline certification testing.

A. Mission Description and Budget Item Justification

Aegis Ballistic Missile Defense (BMD) continues development of a Sea-Based BMD capability in support of the MDA's mission to protect the homeland, deployed forces, friends and allies from ballistic missile threats of all ranges and in all stages of flight.

Aegis BMD 5.0 Capability Upgrade (CU) will enhance legacy Aegis BMD 5.0 by improving endo- and exo-atmospheric capabilities, increasing the maximum number of SM-3s in flight simultaneously, expanding the threat set to include those for European Phased Adaptive Approach (EPAA) Phase II, and increasing this capability by delivering improvements as part of Ballistic Missile Defense System (BMDS) upgrades.

Aegis BMD 4.1 capability builds upon legacy Aegis BMD 4.0 and captured all the threats built into Aegis BMD 5.0 CU. It includes Discrimination Improvements algorithms, and an increased BMD threat set, and provides increased maximum engagements and maximum missiles-in-flight over BMD 4.0.

Aegis BMD 5.1 builds upon Aegis BMD 5.0 CU (COTS based open architecture) and further expands the threat set to include threats which are required for EPAA Phase III. This includes the integration of the SM-3 Block IIA, introduction of an Engage on Remote (EoR) capability, and improved BMDS interoperability and engagement coordination.

Aegis BL 5.4 (BMD 4.1) merges the BMD 4.1 capability with the United States Navy (USN) Aegis Baseline 5.3 into a single integrated computer program with planned Navy Certification in FY 2019. Twenty-one legacy Aegis Flight I/II Destroyers, not planned for Aegis Modernization (AMOD), possess two separate certified computer programs: Aegis BMD 4.0 for Ballistic Missile Defense missions and Aegis Baseline 5.3 for Anti-Air Warfare (AAW), Surface Warfare (SUW), and Undersea Warfare (USW). The Aegis BL 5.4 (BMD 4.1) computer program integrates Aegis Baseline 5.3 and Aegis BMD 4.0 to remedy the need for the warfighter to use both simultaneously.

An additional benefit of the single integrated computer program is enabling future SPY-1 Low Noise Amplifier (LNA) Refurbishment efforts to be added during the ship's Service Life

Following Aegis BL 5.4, the Aegis BL 5.4.X (BMD 4.2) AN/SPY-1 upgrade with the US Navy will provide refurbishment of existing ship AN/SPY-1 radar arrays with the installation of antenna Low Noise Amplifiers (LNAs)(MDA funding beginning in FY19). These refurbished and upgraded antennas, when integrated with Aegis BL 5.4.X (BMD 4.2), will increase BMD capabilities with improved sensitivity, discrimination, and more efficient radar resource utilization.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Aegis BMD 6.x provides an increased BMD capability by incorporating the Air and Missile Defense Radar (AMDR), now designated SPY-6 for introduction on the first DDG Flight III. Aegis BMD 6.0 will enable BMDS element utilization of AMDR data for remote engagement and supplement deployed assets with simultaneous multi-mission capabilities (e.g. Integrated Air and Missile Defense (IAMD)). It will include IAMD planning; search, track, and discrimination. Aegis BMD 6.1 will continue to provide an increased BMD capability with the SPY-6 radar. It will include updates for advanced threats, advanced planning, search, track, and discrimination improvements; and kill assessment updates. SPY-6 will support force-level (multi-asset) approach to raid defense and enable Navy ships greater stand-off range from threat environments.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Title: Aegis Ballistic Missile Defense (BMD) 4.x Development</p> <p align="right">Articles:</p> <p>Description: Aegis BMD 4.1 incorporates the BMD 5.0 CU capability of EPAA Phase II ENDO/EXO requirements including EPAA Phase II Exo-atmospheric threats, integration of the SM-3 Block IB Threat Upgrade (TU), and reintroduction of other Aegis capabilities integrated with the SM-6 Dual I (Endo only). It provides Aegis Modernization capabilities comparable to the BMD 4.0 ships with legacy computer processing architecture.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed 4.1 baseline development as the baseline transitions to co-development with the Navy on merging BMD 4.1 and Navy Aegis Baseline 5.3. - Conducted a Test Readiness Review of BMD 4.1 to determine readiness to begin formal testing by evaluating the preparedness of personnel, plans, and test resources - Conducted an Engineering Evaluation of BMD 4.1 to demonstrate baseline capabilities as a risk reduction activity during development <p>FY 2017 Plans: Decrease from FY 2016 to FY 2017 is due to completion of 4.1 computer program development in FY 2016.</p> <ul style="list-style-type: none"> - Begin merger of BMD Baseline 4.1 and Navy Aegis Baseline 5.3 into a single computer program (BMD 4.x/5.3.x) within the legacy computer program architecture - Execute coordinated development with US Navy on the combined computer program - Conduct System Design Review (SDR) - Conduct Preliminary Design Review (PDR) <p>FY 2018 Plans: Decrease from FY 2017 to FY 2018 due to refinement of integration scope with USN.</p> <ul style="list-style-type: none"> - Conduct Aegis Baseline 5.4 (BMD 4.1) computer program integration efforts, capability development and coding - Conduct Aegis Baseline 5.4 (BMD 4.1) unit test and element computer program integration and test 	26.698	28.264	28.071
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
- Conduct Aegis Baseline 5.4 (BMD 4.1) Engineering Test and Evaluation (ET&E), Multi-Element Integration and Test (MEIT) with regression testing				
<p>Title: Aegis Ballistic Missile Defense (BMD) 5.0 Development</p> <p align="right">Articles:</p> <p>Description: Aegis BMD 5.0 Capability Upgrade (CU) is a combined weapon system developed with the US Navy. It will integrate Aegis BMD 4.0 capability into the Baseline 9 (Open Architecture) common source library. Aegis BMD 5.0 CU will expand the EXO capability, increasing the maximum number of missiles in flight simultaneously and expanding the threat set to include those for EPAA Phase II. Aegis BMD 5.0 CU is an essential capability to meet the requirements of EPAA Phase II and will provide evolutionary improvements in support of deployed forces, friends, and allies.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed Aegis BMD 5.0 CU co-development with the Navy for Aegis Modernization - Completed certification and post-certification effort of EPAA Phase II into the Navy's Open Architecture baselines for fielding in the operational Ballistic Missile Defense System - Completed Aegis Intercept Flight Test as reflected in the IMTP and the Exhibit R-4 schedule for initial operational evaluation of operational effectiveness and suitability - Completed VLS development of the Ordnance Alteration (ORDALT) kit and Quality Assurance (QA) to support fielding of 5.0CU capability on USN ships. Activities support the procurement and fielding of hardware and software associated with the MK 41 VLS to be capable to launch SM-3 Block IA/IB and other missile variants <p>FY 2017 Plans: Funding for completion of Developmental Testing/Operational Testing (DT/OT) testing of Aegis BMD 5.0 CU in Aegis Test 0604878C/MT09. No further funding requested for development.</p> <p>FY 2018 Plans: N/A</p>		17.766 -	0.000 -	0.000 -
<p>Title: Aegis Ballistic Missile Defense (BMD) 5.x Development</p> <p align="right">Articles:</p> <p>Description: Aegis BMD 5.1 builds upon BMD 5.0 CU and will further expand the threat set to include those threats required for EPAA Phase III through the integration of the SM-3 Block IIA, introduction of an Engage on Remote (EoR) capability, and improved BMDS interoperability and engagement coordination. In addition to expanding the BMD battlespace, EoR with SM-3 Block IIA frees up radar resources and increases the number and type of threats that can be engaged simultaneously over previous baselines. Aegis BMD Phase 1 capabilities include SM-3 Block IIA missile integration, SM-3 weapons selection algorithm, enhanced tracking, discrimination and mission planner updates to support organic engagements, Launch-on-Remote</p>		177.356 -	92.364 -	63.400 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>(LoR) engagements, and Long Range Surveillance & Tracking (LRS&T) missions. Aegis BMD 5.1 Phase 1 integration, testing, and evaluation (IT&E) events include various lab-based and shipboard weapon-system-to-missile integration testing utilizing the Virtual Operational Missile (VOM) and the Inert Operational Missile (IOM), as well as participation in BMDS-wide ground test campaigns. Aegis BMD 5.1 Phase 1 development supports early integration and testing with the SM-3 Block IIA missile testing planned for SFTM-1 and SFTM-2. The development of partial capability is contiguous across both Phase 1 and Phase 2 and supports delivery for EPAA Phase III. Aegis BMD 5.1 Combat System certification occurs in FY 2018.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Implemented efforts in test functionality and support of scheduled flight tests - Aegis BMD 5.1 Phase 1 System Development: Continued Engineering, Development, Integration and Testing of the tactical Weapons System computer program, and integration of the SM-3 Block IIA missile. This development reduces risk to Aegis BMD 5.1 Phase 2 and EPAA Phase III by front-loading the development of the weapons system/missile functionality and integration to support the upcoming SCD Flight Test Mission-1 (SFTM-1) and SFTM-2 flight tests - Conducted Engineering Assessment (EA) of Aegis BMD 5.1 functionality, stability, performance and readiness for the test execution of SFTM-1 and SFTM-2 as reflected in the IMTP - Continued software development for the partial Aegis BMD 5.1 Phase 2, which includes all Phase 1 capabilities, and partial EPAA Phase III capabilities and threats - Continued assessment cycles to prepare certification and deployment of Aegis BMD 5.1 computer program at sea and ashore for EPAA Phase III - Conducted Aegis BMD 5.1 Vertical Launching System (VLS) Formal Integration and Qualification Testing required for the fielding of 5.1 capability on DDG Flight I & II configured USN ships and Aegis Ashore - Continued Aegis BMD VLS modifications required for the fielding of 5.1 capability on DDG Flight IIA configured USN ships - Evaluated Mark (MK) 41 VLS performance results during Controlled Test Vehicle-1 (CTV-1) and CTV-2 and applied results to verify the capability of MK 41 VLS to fire the SM-3 Block IIA prior to shipboard testing - Conducted Aegis BMD 5.1 MK 41 VLS Formal Integration and Qualification Testing in support of fielding on DDG Flight I and IIA ship configurations - Provided MK 41 VLS support to Aegis Integration Event (AIE) to verify the compatibility of the MK 41 VLS firing the SM-3 Block IIA with Aegis BMD 5.1 and performed regression testing - Conducted Aegis BMD 5.1 MK 41 VLS Certification and Safety Assessments for shipboard fielding to obtain Naval Ordnance System Safety Activity authorization for the placement of the SM-3 Block IIA in the MK 41 VLS approving the safe firing of the SM-3 Block IIA - Execute provisions for transition to production of Aegis BMD 5.1 MK 41 VLS modifications required on USN ships for the fielding of 5.1 capability with SM-3 Block IIA 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

All efforts on schedule to meet EPAA Phase III deployment

FY 2017 Plans:

Decrease from FY 2016 to FY 2017 is due to completion of major development functionality and shifting focus to implementation and development testing at-sea and completion of VLS Development efforts and transition to fielding and sustainment.

- Continue software development for the Aegis BMD 5.1 Phase 2, which includes all BMD 5.1 capabilities, including EPAA Phase III capabilities and threats
- Incorporate developmental and maintenance Computer Program Correction Reports (CPCRs) as defined from Developmental Testing (DT)
- Provide preparation activities and post-mission analyses of flight tests
- Provide lab-based and shipboard Integration Testing & Evaluation (IT&E), fulfilling agreement with Japan in the SM-3 Block IIA Cooperative Development program
- Conduct integration testing for Command and Control Processor (C2P) Tech Refresh and Common Data Link Management System (CDLMS) 3.9 to support pre-mission analysis of EoR engagement
- Conduct Jamming Exercise (JAMEX), Functional Assessments (FA) and System Functional Tests (SFT) in preparation for the Demonstration of Aegis BMD 5.1
- Conduct demonstration of Aegis BMD 5.1 to assess and accurately characterize the BMD 5.1 Aegis Combat System (ACS) computer program implementation for the deployment and execution of developmental test / operational test as reflected in the IMTP
- Support BMDS ground test events as reported in the IMTP
- Perform assessment cycles to prepare certification and deployment of Aegis BMD 5.1 computer program at sea and ashore for EPAA Phase III
- Conduct pre-mission analyses, integration testing events, Test & Evaluation Working Group (TEWG) planning activities in support of the IMTP

All efforts on schedule to meet EPAA Phase III deployment

FY 2018 Plans:

Decrease from FY 2017 to FY 2018 is due to completion of development functionality implementation and completion of baseline certification testing

- Continue development testing at-sea, supporting BMDS ground test events, collecting objective qualitative evidence (OQE) to support Navy certification, MDA Operational Capability Baseline review, and EPAA Phase III Technical Capability Declaration (TCD)

	FY 2016	FY 2017	FY 2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Incorporate developmental and maintenance Computer Program Correction Reports (CPCRs) as defined from Developmental Testing (DT) - Complete system functional testing at both lab-based and shipboard installations. Includes integration, checkout, pre-mission analysis, preparation activities, and post-mission analyses to provide the critical Objective Qualify Evidence (OBE) in support Navy certification of the Aegis BMD 5.1 computer program - Conduct C2P Tech Refresh and Common Data Link Management System (CDLMS) 3.9 to support pre-mission analysis of EoR engagement, to support the installation on ships and ashore - Conduct development testing to assess Aegis BMD 5.1 computer program compliance with maintainability requirements - Perform assessment cycles to evaluate system maturity and progress towards certification and deployment of the Aegis BMD 5.1 computer program at sea and ashore for EPAA Phase III - Conduct Navy link certification, Navy Maintainability Demonstration, and Navy Combat System certification in support of EPAA Phase III deployment 			
<p>Title: Aegis Ballistic Missile Defense 6.x Development</p> <p align="right">Articles:</p>	13.125	26.305	79.207
<p>Description: U.S. Navy is developing the Advance Capability Build (ACB) 20 Combat System (CS) and the Air and Missile Defense Radar (AMDR), now designated SPY-6, for introduction on the first DDG Flight III. Aegis BMD 6.x development consists of two major components: Aegis BMD 6.0 and Aegis BMD 6.1. Aegis BMD 6.0 will integrate BMD 5.1 capability with the ACB 20 Combat System, to include new SPY-6 requirements; this will enable BMDS element utilization of AMDR data for remote engagements and supplement deployed assets with simultaneous multi-mission capabilities (e.g. IAMD). It will include updates for IAMD planning; search, track, and discrimination. Additionally, Aegis BMD 6.1 will continue to provide an increased BMD capability with the SPY-6 radar. It will include further updates for advanced threats, advanced planning, search, track, discrimination improvements; and kill assessment updates. SPY-6 will support force-level (multi-asset) approach to raid defense and will enable Navy ships to have a greater stand-off range from threat environments. Aegis BMD 6.1 will build upon BMD 6.0 and will serve as the path forward to achieve BMDS Increment 6 threats, Electro Optical Integration (EO/IR) for remote engagements, and increased raid capacity.</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Conduct trade studies and concepts supporting A-Spec development - Conduct development of BMD 6 ES - Conduct Aegis BMD low-level performance analysis supporting SFR - Prepare for Preliminary Design Review (PDR) - Continued participation in program leadership and technical forums including Program Management Team, System Engineering Cross Product Team (CPT), Capability Working Groups, Modeling & Simulation CPT, and Test, Evaluation & Certification CPT 	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

FY 2016 Accomplishments:
 BMD 6.0 baseline development
 - Prepared for and conducted BMD 6.0 System Requirements Review (SRR)
 - Developed the BMD 6 Element Specifications and conducted government performance feasibility analysis to establish BMD 6.0 requirements baseline
 - Generated supporting engineering planning documents for Baseline development
 - Compiled SRR data package and conducted Navy Review Team (NRT) review to validate system requirements
 - Conducted threat data updates in support of generation of BMD and IAMD compliance cases
 - Conducted preliminary high-fidelity analysis characterizing SPY-6's Long Range Ballistic Missile (LRBM) search and track capability
 - Identified and documented options for modifying the functional allocation breakdown of the Probability of Single Shot Engagement Kill (Pssek and Probability of Surveillance Support (Pss) used for BMD 5.1 for application to BMD 6.0 and the introduction of SPY-6
 - Prepared for and conducted multiple BMD 6.0 Flag Status Reviews

FY 2017 Plans:
 Increase from FY 2016 to FY 2017 is all inclusive to the following:
 - Prepare for System Functional Review (SFR) to finalize the BMD components of the ACB 20 Combat System Requirements (A-Spec)
 - Assess feasibility analysis of BMD 6 Element Specification (ES) performance requirements
 - Develop supporting engineering planning documents
 - Compile SFR data package and conduct Navy Review Team (NRT) review to validate system requirements
 - Initiate development of the ACB 20 Prime Item Development Specification (PIDS) requirements and Critical Item Development Specification (CIDS) requirements
 - Prepare for Preliminary Design Review (PDR) to finalize the BMD components of the ACB 20 PIDS
 - Conduct trade studies and concepts supporting PIDS and CIDS development
 - Conduct Aegis BMD performance analysis supporting PDR
 - Compile PDR data package and begin NRT review to validate system requirements

FY 2018 Plans:
 Increase from FY 2017 to FY 2018 attributed to detailed design of Aegis BMD 6.0 in preparation for Critical Design Review (CDR) which will finalize the baseline program performance requirements and commencement of the Aegis BMD 6.1 baseline development to increase performance against advanced ballistic missile threats

FY 2016	FY 2017	FY 2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<p>BMD 6.1 baseline development</p> <ul style="list-style-type: none"> - Conduct development of BMD 6 ES for additional threats for greatly expanded capability of the BMDSS - Prepare for and conduct Preliminary Design Review - Develop CIDS, Interface Description Specifications (IDS) and all supporting engineering document and plans - Conduct Aegis BMD performance analysis supporting Critical Design Review (CDR) - Prepare and conduct System Requirements Review (SRR) - Conduct trade studies and concepts supporting A-Spec development - Conduct Aegis BMD low-level performance analysis supporting SRR 			
---	--	--	--

Title: Standard Missile-3 (SM-3) Block IB Development	14.619	1.958	0.000
Articles:	-	-	-

Description: This effort develops the SM-3 Block IB missile, which improves on the SM-3 Block IA performance and enables engagement of more sophisticated ballistic missiles and larger raid sizes.

SM-3 Block IB Modernization will provide the following upgrades:

- Upgraded SM-3 KW Common Avionics Package will provide improved producibility and reduced cost resulting from utilization of common components between SM-3 Block IIA and the Redesigned Kill Vehicle (RKV). SM-3 Block IB Common Components will be extendable to support different form/fit in circuit card assemblies across SM-3 Block IB, SM-3 Block IIA, and RKV and will mitigate SM-3 Block IB hardware availability issues.
- Upgraded SM-3 Block IB Guidance Section (GS) will resolve Computer Processing Unit 3 and Plate 3A hardware availability issues, enable use of 5.1/IIA Target Object Map (TOM) and similar software to SM-3 Block IIA Mission Computer; and enable additional capability against complex threats.

FY 2016 Accomplishments:

- Assessed the SM-3 Block IB missile capability against evolving threat characteristics to define improvements in missile discrimination processes to counter threat changes
- Began development of common avionics architecture between SM-3 Block IB and SM-3 Block IIA. This includes a SM-3 Block IB sized Read Out Integrated Circuit (ROIC) based on SM-3 Block IIA technology for increased acquisition range for greater capability against extended range threats, repackage SM-3 Block IIA Kinetic Warhead (KW) Guidance Electronic Unit (GEU) hardware to fit within SM-3 Block IB allowing implementation of SM-3 Block IIA software improvements to enhance missile performance against advanced threats

FY 2017 Plans:

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Decrease from FY 2016 to FY 2017 is due to deferral of further development of the SM-3 Block IB sized Read Out Integrated Circuit (ROIC) based on SM-3 Block IIA technology for increased acquisition range			
FY 2018 Plans: All efforts for this accomplishment have transitioned to Budget Project, MM09 Aegis BMD SM-3 Development			
Title: Standard Missile-3 (SM-3) Block IIA Development	78.246	213.271	0.000
Articles:	-	-	-
Description: The SM-3 Block IIA is required to meet EPAA Phase III. It will increase the area that can be defended by Aegis BMD, increase the probability of kill against a larger threat set, and leverage enhanced capability provided by BMDS sensor upgrades.			
Recurring Accomplishments: <ul style="list-style-type: none"> - Conduct SM-3 Block IIA software update to support engagements against additional complex threats identified during Aegis BMD 5.1 design process conducted after missile Critical Design Review (CDR) - Conduct End to End Distributed Development System (ETEDDS) integration testing; and flight test support - Continue implementation of SM-3 Block IIA cost reduction initiatives to support meeting cost goals to reduce the current estimated Average Unit Production Price (AUPP) 			
FY 2016 Accomplishments: <ul style="list-style-type: none"> - Continued Aegis BMD 5.1 weapon system and SM-3 Block IIA Missile integration and testing - Continued Kinetic Warhead (KW) Guidance Electronic Unit (GEU) hardware commonality development efforts to enhance missile performance against advanced threats - Continued adaptations to the SM-3 Block IIA missile to include software and G-switch modifications that meet range safety requirements for Aegis Ashore. - Began Guidance Section Circuit Card Assembly manufacturing environmental test capability improvements to reduce Average Unit Production Price (AUPP) 			
FY 2017 Plans: Increase from FY 2016 to FY 2017 is due to: <ul style="list-style-type: none"> - Transition of Kinetic Warhead (KW) hardware commonality effort (from design to material purchases) to system integration testing in order to demonstrate technology readiness level 7 - Implementation of updated missile software build, test and qualification for FTM-29 and FTO-03 flight testing, - Increased integration testing with Aegis Baseline based on matured test requirements 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>- Continue Guidance Section Circuit Card Assembly manufacturing environmental test capability improvements to reduce Average Unit Production Price (AUPP)</p> <p>- Build up SM-3 Block IIA All Up Round(AUR)for FTM-29 from residual Standard Missile-3 Cooperative Development(SCD)Program hardware to address schedule impact from long lead material for FY2016 manufacturing contract</p> <p>Efforts will also:</p> <ul style="list-style-type: none"> - Continue SM-3 Block IIA engineering integration and testing with the Aegis BMD 5.1 Weapon System - Support Parts, Materials, Processes, Mission Assurance, and System Engineering as it relates to the SM-3 Block IIA - Complete adaptations to the SM-3 Block IIA missile to include software and G-switch modifications that meet range safety requirements for Aegis Ashore <p>FY 2018 Plans: All efforts for this accomplishment have transitioned to Budget Project, MM09 Aegis BMD SM-3 Development</p>			
<p>Title: Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion</p> <p align="right">Articles:</p> <p>Description: Aegis BMD Core System Engineering enables cross-baseline specification management and capability assessments to ensure consistent application of technical standards, processes, and procedures across the Aegis BMD program. Efforts include: systems engineering and architecture (process and execution), modeling and simulation (M&S), test and evaluation support, ship integration, quality, safety and mission assurance.</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Conduct further development of Aegis BMD System Architecture and overarching system concepts - Conduct BMDS system level requirements development, trace, validation and verification, and configuration management for coordination with all participating external agencies and organizations - Ensure consistency and alignment of Command, Control, Communications, Computers, and Intelligence (C4I) implementation across Aegis BMD baselines <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Development of the Planned Product Improvement for both Divert and Attitude Control System (DACs) and Third Stage Rocket Motor (TSRM) for SM-3 - Conducted medium fidelity Monte Carlo Analysis to align Aegis BMD Capability Baselines with BMDS performance requirements, design space and threat capability assessments - Developed Performance Assessment Matrix, Threat Compliance and Critical Engagement Conditions/Empirical Measurement Events (CEC/EMEs) to influence Aegis BMD Test and Evaluation efforts through a requirements based input to the MDA's IMTP 	38.025	30.345	40.268
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Conducted model development and Verification and Validation (V&V) in support of Commander Operational Test & Evaluation Force (COMOPTEVFOR) model accreditation - Conducted model development required for participation in exercises and wargames in support of the Warfighter - Conducted Aegis BMD Hardware-in-the-Loop (HWIL) integration and transition to the Objective Simulation Framework (OSF) with focus on OSF Interface development for Aegis BMD 4.1 and BL 9C.2 - Conducted systems engineering for digital M&S transition to OSF - Developed advanced discrimination algorithms related to the Aegis BMD baselines in support of discrimination improvement requirements - Demonstrated updated discrimination and developed a plan for insertion into the Aegis BMD Baselines and SM-3 variants to eliminate gaps and enable future BMDS architectures in support of Discrimination Improvements requirements - Participated in discrimination improvement threat models specification development - Updated element models to support the discrimination improvement program - Planned and conducted technology trades and analysis to refine capabilities to mitigate the discrimination improvements threats - Conducted studies to address the BMDS emergent threat <p><i>FY 2017 Plans:</i> Increase from FY 2016 to FY 2017 is attributed to the addition of critical experiment execution and Firing Event Analysis Team (FEAT) execution support.</p> <ul style="list-style-type: none"> - Conduct Systems Engineering for medium fidelity Monte Carlo Analysis which will contribute to Aegis BMD capability baselines and BMDS alignment for performance requirements, design space, and threat capability assessments - Continue to develop Performance Assessment Matrix, Threat Compliance and CEC/EME's to influence Aegis Test and Evaluation efforts through a requirements based input to the IMTP - Develop C4I System Safety Program to address concerns with inadvertent launch and incorrect reporting of non-real ballistic missile tracks - Develop and implement Integrated Reliability Surveillance Plan (IRSP) to improve system availability while achieving an overall reduction in cost - Provide consolidated analysis and reporting for firing events - Continue to maintain/upgrade the Aegis BMD M&S requirements and capabilities identified to meet the needs for Tier 2 Digital OSF - Conduct Systems Engineering tasking for model development and Verification & Validation (V&V) of Aegis BMD models in support of COMOPTEVFOR accreditation - Provide Aegis BMD M&S Enterprise Requirements Management and Change Control - Continue model development required for participation in exercises and force-on-force analysis in support of the warfighter/ Combatant Commands (CCMDs) 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Provide Aegis BMD M&S support for Operational Test (OT) Runs for Record (RFR)planning - Provide Aegis BMD M&S support for BMDS assessments, OSF/BMDS requirements development and analysis and BMD-Level V&V - Provide Aegis BMD M&S planning and integration in preparation for continuous Tier 2 Digital events - Execute Critical Experiments for proposed capability development efforts requiring HWIL verification. Proposed capabilities requiring HWIL include: Sensor Coordination & Planning, Electro-Optical/Infrared (EO/IR) Sensor Integration, and Infrared/Radio Frequency (IR/RF) Data Fusion and Correlation - Continue to improve the design of critical components to alleviate limiting legacy assumptions and caveats; provide a stronger basis for subsequent design initiatives - Continue development of discrimination improvements to improve detection, tracking, discrimination and correlation of threats - Continue Near-Term discrimination algorithm insertion and testing - Implement threat data and modeling updates - Continue to develop and mature RF and IR Mid-Term discrimination algorithms, modeling and simulation, and prototype codes for AN/SPY-1 and SM-3 systems, respectively - Develop and mature Weapon Systems algorithm concepts that exploit AN/SPY-6 design features - Define modifications for implementation of LINK 16 Interface Change Proposals (ICPs) required for Mid-Term discrimination <p>FY 2018 Plans: Increase from FY 2017 to FY 2018 attributed to development of C4I capabilities to support commencement of Aegis BMD 6.x baseline, and increased element-level support for discrimination improvements and countermeasures mitigation.</p> <ul style="list-style-type: none"> - Conduct Command, Control, Computer, Communications and Intelligence (C4I) systems engineering to further develop Aegis BMD requirements, and to identify and resolve BMDS interoperability issues - Define and coordinate development and implementation of C4I capabilities in U.S. Navy C4I programs of record to meet Aegis BMD requirements - Test and certify Deterministic Routing for Aegis Ashore and Aegis BMD ships to maintain interoperability with the BMDS - Conduct Navy and Joint Link certifications required for BMD Baseline certifications for operational deployment - Design, develop, test, and certify overhead satellite data sources to meet Aegis BMD fire control capabilities in support of dual path requirement in Aegis BMD 5.1 - Manage and implement the BMDS Test Site (BTS) San Diego upgrade plan to maintain fleet representative Weapon System and C4I configurations to support testing, troubleshooting, and Fleet operations - Continue model development and V&V in support of COMOPTEVFORBL 9.C2 M&S accreditation - Conduct COMOPTEVFOR Operational Test Runs for the Record (OT RFR) tasks in support of BL 9.C2 VV&A - Continue software upgrades for SM-3 6DoF integration and IAMD in support of COMOPTEVFOR VV&A and OT RFRs 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<ul style="list-style-type: none"> - Continue Aegis BMD CEC/EME tasks to support improvement of development and models of System or Element behaviors - Provide consolidated analysis and reporting for firing events - Continue Ground Test Campaign support for BMDS in support of Operational Capability Baseline (OCB) declaration - Continue to Conduct BMDS-level V& V activities and provide results to MDA System Verification Team and the OTA in support of BMD system level accreditation for BMDS events - Continue model development and sustainment required for participation in exercises and force-on-force analysis in support of the warfighter/Combatant Commands (CCMDs) - Continue to provide BMDS M&S Requirements Management and Development - Complete development of discrimination improvements to improve detection, tracking, discriminating, and correlation of threats - Complete Near-Term discrimination algorithm insertion and testing - Continue to develop and mature RF and IR Mid-Term discrimination algorithms, modeling and simulation, and prototype codes for AN/SPY-1 and SM-3, respectively - Continue to develop and mature Weapon Systems algorithm concepts and modeling and simulation updates which exploit AN/SPY-6 design features - Complete system modifications required for implementation of Link 16 Interface Change Proposals required for Mid-Term discrimination 			
---	--	--	--

Title: Program Operations	119.785	113.038	0.000
Articles:	-	-	-

Description: This accomplishment has recurring efforts. This activity funds the Government, contractor, and Federally Funded Research and Development Center (FFRDC) workforce that manage the overall Aegis Ballistic Missile Defense (BMD) program and enables the program to develop, build, and test standard missiles and the associated Aegis Weapon Systems. This project includes all operations support for the Aegis program office in Engineering, Testing, Logistics, Acquisition, Safety, Quality Assurance, Finance, Budget Formulation and Execution, Cost Estimation, and Earned Value Management in support of development activities.

FY 2016 Accomplishments:
SEE ABOVE

FY 2017 Plans:
Decrease from FY 2016 to FY 2017 due to a cost savings attained through consolidation of contractor tasks and efforts performed in support of the Aegis program office.

SEE ABOVE

FY 2018 Plans:

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

All efforts for this accomplishment have transitioned to Budget Project, MX09 Aegis Ballistic Weapon System Integration and Operations SEE ABOVE			
---	--	--	--

Title: FY16 SM-3 Block IIA RDT&E All Up Rounds	115.948	254.654	0.000
---	---------	---------	-------

Description: Manufacture FY 2016 SM-3 Block IIA All Up Rounds (AURs) for the purposes of flight testing and delivery to the fleet as operational assets prior to an initial production decision.	Articles: -	-	-
---	-----------------------	---	---

Recurring Accomplishment:
Deliver SM-3 Block IIA AURs

FY 2016 Accomplishments:
Award of the follow-on full scope of effort to produce SM-3 Block IIA missiles in support of flight testing and delivery to fleet for initial deployment in FY 2018

- SM-3 Block IIA AURs for use in support of flight test events as reflected in the IMTP, and initial deployment in support of EPAA Phase III. SM-3 Block IIA AURs validate the EMRL 3 criteria for an Initial Production Decision in FY 2018

Funding for DoD Civilian and Contractor support moved to Project MD09, Program Operations
Funding for Aegis Systems Engineering efforts moved to Project MD09, Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion

FY 2017 Plans:
Increase in FY 2017 is attributed to the following:

- Incremental funding increased from FY2016 levels to match manufacturing expenditure profile for seventeen FY16 contracted SM-3 Block IIA AURs, funding requirements aligned with next FY2017 increment of component, sub-section and section manufacturing and delivery schedules to support AUR deliveries beginning FY2018
- Realignment of funding from IIA Development to support for manufacturing, assembly, test, and missile integration issues and assessing vendor non-conformances, process changes, variances, change notices, drawing changes, deviations and compliance actions

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Continue funding for quantity 17 SM-3 Block IIA AURs (scheduled delivery FY 2018 through FY 2020) for use in flight test events as reflected in the IMTP, and initial deployment of EPAA Phase III. SM-3 Block IIA AURs validate the Engineering Manufacturing Readiness Level 3 criteria for an Initial Production Decision in 4Q FY 2018			
FY 2018 Plans: All efforts for this accomplishment have transitioned to Budget Project, MG09 Aegis BMD SM-3 Development Articles			
Title: Modeling & Simulation Objective Simulation Framework	40.146	40.084	37.141
Articles:	-	-	-
Description: This effort develops, maintains and deploys the framework hardware and software for use at element laboratories and Combatant Command (CCMD) locations to support IMTP events, BMDS capability delivery assessments, Warfighter training, exercises, and wargames. Recurring Accomplishments: - Develop and implement Objective Simulation Framework (OSF) upgrades to incorporate advanced tracking, discrimination, engagement and associated upper tier debris mitigation capabilities, as well as other requirements and capabilities to meet MDA's evolving M&S Enterprise needs. - Sustain and enhance framework products to maintain capabilities to support stakeholders. - Develop plans, procedures and documentation for scheduled events including Wargames and Combatant Command Exercises and the Distributed, Focused and Integrated HWIL Events as presented in the IMTP. Provide event architecture integration and checkout of Wargames for these same IMTP scheduled events. - Provide the ground test architecture integration expertise to meet the testing requirements of the IMTP. Support delivery of integrated architectures for test across all test venues using the BMDS test framework to integrate distributed architectures in support of BMDS. - Develop, maintain, test, field, and operate model representations for use in events and other MDA M&S stakeholder application areas. Deploy hardware and software updates to distributed sites. Perform regular maintenance and critical repairs of hardware and software. - Support MDA's Experimental End-to-end Digital Integrated System-level Simulation (X-EDISS) requirements, referred to Tier 2 Digital in previous reports, requirements, including hardware and software, data storage and transmission, and verification tools. - Control and maintain the M&S Integration and Development Laboratories for Element M&S. Maintain venue for stakeholders to conduct early integration efforts and identification of issues prior to event architecture integration to support system development. - Deploy System Interface Units (SIUs) for BMDS testing - materials, licenses, SIU fleet purchasing. Deploy SIUs and components to maintain and sustain SIU fleet including cybersecurity; enables Developmental and Operational testing with full BMDS as required in IMTP.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>- Continue maintenance of the Single Stimulation Framework in the required venues until the transition of the Objective Simulation Framework into the venues completes.</p> <p>Note: This accomplishment was renamed from M&S HWIL Framework, Simulations, Models to reduce confusion between similarly named accomplishments.</p> <p>FY 2016 Accomplishments: Conducted activities listed in the Description section (SEE ABOVE).</p> <p>FY 2017 Plans: Conduct activities listed in the Description section (SEE ABOVE).</p> <p>FY 2018 Plans: Conduct activities listed in the Description section (SEE ABOVE).</p>				
<p>Title: Systems Engineering & Integration</p> <p align="right">Articles:</p> <p>Description: Perform requirements development, engineering analysis, capability integration, and performance verification for Aegis BMD development and BMDS integration, including Aegis BMD compliance with the BMDS Specification, BMDS Description Document, and Master Integration Plan (MIP).</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Conduct system level performance analyses to support ongoing BMDS Architecture and Systems Engineering efforts - Perform top-down system level engineering analysis, capability integration, and performance verification for Aegis BMD development and BMDS integration, including Aegis BMD compliance with the BMD System Specification, BMD System Description Document, and Master Integration Plan (MIP) - Identify architecture alternatives that improve the BMD System's performance and are complementary to and interoperable with NATO systems and theaters around the world - Define BMDS technical content expectations and develop system requirements, to include integration of new capabilities, such as the Navy's Air and Missile Defense Radar (AMDR) - Develop functional performance, interface, and design suitability requirements in collaboration with Aegis BMD engineers to ensure correct flow-down and allocation of BMD System-level requirements to Aegis BMD - Respond to Warfighter, Combatant Command and other requests for analyses and requests for information; provide analytical support for real-world events 		19.109	19.405	18.530
		-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<p>- Conduct non-advocate assessments of BMDS capabilities and limitations prior to capability delivery decisions to determine fielding readiness (including Theater/Regional BMD)</p> <p>- Conduct extensive analysis of data collected in BMD test events to evaluate BMD System operations and performance.</p> <p>FY 2016 Accomplishments: Conducted activities listed in the Description section (SEE ABOVE).</p> <p>FY 2017 Plans: Conduct activities listed in the Description section (SEE ABOVE).</p> <p>FY 2018 Plans: Conduct activities listed in the Description section (SEE ABOVE).</p>			
---	--	--	--

Title: M&S BMDS Simulations & Tools	4.989	4.978	5.227
--	-------	-------	-------

Articles:	-	-	-
------------------	---	---	---

Description: This effort includes: development and sustainment of digital products and the architecture framework, and delivery/maintenance of infrastructure for BMDS performance assessments.

Recurring Accomplishments:

- Integrate, test, and verify the M&S enterprise supporting BMDS testing, assessment, exercises, and wargaming, including testing infrastructure. Guide and facilitate integration testing of MDA's M&S frameworks and core truth models, and all M&S components into virtual representations of the BMDS that are credible, affordable, and provide decision makers with the data needed
- Integrate, test, functionally qualify, and deliver M&S tools and complex test architectures to provide system test capabilities to support MDA IMTP based test events, wargames, and exercises
- Continue the transition of real-time digital simulation capability to the OSF to support Intended Uses
- Provide HWIL/M&S Benchmarking/Integration documentation and coordination
- Conduct M&S system integration and verification to support M&S system architecture development. Provide developmental integration testing to support M&S system architecture integration

Note: this accomplishment was renamed from M&S Digital Framework, Simulation, Models to reduce confusion between similarly named accomplishments.

FY 2016 Accomplishments:
Conducted activities listed in the Description section (SEE ABOVE).

FY 2017 Plans:

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017
Conduct activities listed in the Description section (SEE ABOVE).			
FY 2018 Plans: Conduct activities listed in the Description section (SEE ABOVE).			
Title: BMDS Verification, Validation & Assessment (VV&A)		20.724	21.362
Articles:		-	-
Description: This activity funds BMD System Assessment and Verification, Validation, and Accreditation (VV&A) activities to support BMDS Operational Capacity Baseline (OCB) delivery decisions and Technical Capability Declarations (TCDs), and anchor System modeling and simulation.			
Recurring Accomplishments:			
<ul style="list-style-type: none"> - Verify BMDS performance, and produce BMDS verification status reports - Conduct extensive analysis of data collected in BMDS ground and flight test events, instrumental to understanding BMD System operations and performance and anchoring models and simulations - Identify mitigation approaches for BMDS performance issues uncovered during system level analysis and assessment - Maintain M&S Verification, Validation and Accreditation (VV&A) database, and verification data for BMD System Specification Change Notices - Develop, maintain, and update the M&S VV&A tool kit - Provide recommendations for improving assessment confidence, including M&S and testing issue resolutions - Conduct verification and validation (V&V) in support of MDA BMD System level accreditation process in support of BMDS Ground Test and performance assessment events - Conduct specified BMD System post-flight reconstructions, element post-flight reconstructions, and pre-mission testing events so as to optimize the body of evidence and analysis supporting system-level BMDS accreditation. 			
FY 2016 Accomplishments: Conducted activities listed in the Description section (SEE ABOVE).			
FY 2017 Plans: Conduct activities listed in the Description section (SEE ABOVE).			
FY 2018 Plans: Conduct activities listed in the Description section (SEE ABOVE).			
Accomplishments/Planned Programs Subtotals		686.536	846.028
		20.219	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	
			Base	OCO	Total					Complete	Total Cost
• 0604878C: <i>Aegis BMD Test</i>	78.468	95.012	134.468	-	134.468	73.059	82.570	113.856	97.660	Continuing	Continuing
• 0604880C: <i>Land Based SM-3 (LBSM3)</i>	29.288	43.293	30.486	-	30.486	31.816	33.024	31.707	30.924	Continuing	Continuing
• 0604881C: <i>AEGIS SM-3 Block IIA Co-Development</i>	165.456	106.038	9.739	-	9.739	0.000	0.000	0.000	0.000	0	281.233

Remarks

D. Acquisition Strategy

The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively.

The M&S acquisition strategy utilizes full and open competition to develop, acquire and deliver the integrated architectures/frameworks, as well as develop and deliver models of Aegis systems. The Digital and HWIL product centers integrate the suite of M&S into a composite simulation capability, all based on an open architecture. M&S achieves this end-state via close collaboration between its integrating contractor teams (Digital and HWIL) and those of the Aegis BMD prime contractors, with additional technical standards and engineering oversight provided by Federally Funded Research and Development Centers (FFRDCs) and University Affiliated Research Centers (UARC).

E. Performance Metrics

AEGIS BMD utilizes Award Fee and Incentive-based contracts to ensure project completes on time

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aegis Ballistic Missile Defense (BMD) 4.x Development - BMD 4.0 Dev -MD09- Aegis Techrep	MIPR	AEGIS Techrep : Moorestown, NJ	2.114	0.000		1.324	Nov 2016	1.422	Nov 2017	-		1.422	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 4.x Development - BMD 4.0 Dev. - MD09 - D	MIPR	MDA : VA	20.309	5.342	Nov 2015	2.122	Jul 2017	2.608	Nov 2017	-		2.608	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 4.x Development - BMD 4.0 Dev. - MD09 - Dahlgren	MIPR	NSWC/DD : DAHLGREN, VA	131.188	9.617	Nov 2015	1.822	Nov 2016	1.956	Nov 2017	-		1.956	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 4.x Development - BMD 4.0 Dev. - MD09 - Lockheed Martin	SS/CPIF	LOCKHEED MARTIN : MOORESTOWN, NJ	753.701	6.415	Nov 2015	22.996	Nov 2016	22.085	Nov 2017	-		22.085	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 4.x Development - BMD 4.0 Dev- No longer funded in the FYDP	Various	Various : Various	37.778	5.324		0.000		0.000		-		0.000	0	43.102	0
Aegis Ballistic Missile Defense (BMD) 5.0 Development - MD09- No longer funding in the FYDP	Various	Various, : Various	921.251	17.766	Nov 2015	0.000		0.000		-		0.000	0	939.017	0
Aegis Ballistic Missile Defense (BMD) 5.x Development - 6.x - D	MIPR	MDA : Ft. Belvoir, VA	0.000	0.000		0.000		2.708	Nov 2017	-		2.708	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 5.x Development - MD09 - 20117142323680	MIPR	NSWC/DD : DAHLGREN, VA	39.308	7.237	Nov 2015	9.863	Nov 2016	12.270	Nov 2017	-		12.270	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Ballistic Missile Defense (BMD) 5.x Development - MD09 - 20117142323684	MIPR	NSWC/PHD : PT HUENEME, CA	2.813	5.060	Nov 2015	4.858	Nov 2016	1.230	Nov 2017	-		1.230	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 5.x Development - MD09 - 20117142323686	MIPR	JHU/APL/MD : COLUMBIA, MD	40.129	6.169	Nov 2015	5.808	Nov 2016	3.720	Nov 2017	-		3.720	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 5.x Development - MD09 - 20117142323689	SS/CPAF	LOCKHEED MARTIN : MOORESTOWN, NJ	457.632	133.685	Nov 2015	68.130	Nov 2016	40.632	Nov 2017	-		40.632	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 5.x Development - MD09 - AW	MIPR	Aegis Tech Rep : Moorestown, NJ	2.049	0.000		3.705	Nov 2016	1.560	Nov 2017	-		1.560	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 5.x Development - MD09 - Various	MIPR	Various : MA, MD, VA, NJ	68.745	1.780	Nov 2015	0.000		1.280	Nov 2017	-		1.280	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) 5.x Development - MD09- No longer funded in the FYDP	Various	Various : Various	106.069	23.425	Nov 2015	0.000		0.000		-		0.000	0	129.494	0
Aegis Ballistic Missile Defense 6.x Development - Hanscom AFB - MIT/LL - TD	MIPR	Hanscom AFB - MIT/LL : MA	0.000	0.975		0.406		1.679	Nov 2017	-		1.679	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense 6.x Development - JHU/APL	SS/CPFF	JHU/APL : MD	0.000	1.775		7.241	Nov 2016	9.054	Nov 2017	-		9.054	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense 6.x Development - Lockheed Martin	C/CPFF	Lockheed Martin : NJ	0.000	5.836		12.260	Nov 2016	51.753	Nov 2017	-		51.753	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense 6.x Development - MD09 - DD	MIPR	NSWC/DD : Dahlgren, VA	0.000	2.225		3.971	Nov 2016	4.500	Nov 2017	-		4.500	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aegis Ballistic Missile Defense 6.x Development - NAVSEA	MIPR	NAVSEA : Sudbury, MA	0.000	0.000		0.000		2.600	Nov 2017	-		2.600	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense 6.x Development - NSWC DD-TD	MIPR	NSWC/DD : VA	0.000	0.894		2.427	Jul 2017	1.733	Nov 2017	-		1.733	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense 6.x Development - Raytheon	SS/CPIF	Raytheon : Tucson, AZ	0.000	1.375		0.000		6.508	Nov 2017	-		6.508	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense 6.x Development - Tech Rep	MIPR	Aegis TechRep : Moorestown, NJ	0.000	0.045		0.000		1.380	Nov 2017	-		1.380	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development-MD09- Corona	MIPR	NSWC Corona : Corona, CA	1.349	0.000		0.375	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development-MD09-20117142332259	MIPR	NSWC/PHD : Port Huememe, CA	14.082	0.000		0.335	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development-MD09	SS/CPAF	Raytheon : Tucson	1,007.907	14.619	Nov 2015	0.972	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development-MD09- No longer funding in the FYDP	Various	Various : Various	127.066	0.000		0.276	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - CA,VA, MD	MIPR	Various : CA, VA, MD	0.191	0.000		3.600	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Standard Missile-3 (SM-3) Block IIA Development - MD09 - SM-3 BLK IIA AFFORDABILITY DEVELOPMENT- No longer funding in the FYDP	SS/CPIF	Raytheon : Tucson, AZ	0.000	12.100	Nov 2015	25.424	Nov 2016	0.000		-		0.000	0	37.524	0
Standard Missile-3 (SM-3) Block IIA Development - MD09 - SM-3 BLK IIA INTEGRATION	SS/CPIF	Raytheon : Tucson, AZ	60.992	42.900	Nov 2015	159.247	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - MD09 - SM-3 BLK IIA INTEGRATION - APL	MIPR	JHU/APL : Laurel, MD	0.225	13.400	Nov 2015	14.300	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - MD09 - SM-3 BLK IIA INTEGRATION - DD	MIPR	NSWC DD : Dahlgren, VA	0.401	9.846	Nov 2015	10.000	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - NSWC Corona	MIPR	NSWC Corona : Corona, CA	0.010	0.000		0.400	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - NSWC/Crane	MIPR	NSWC/Crane : IN	0.000	0.000		0.300	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD APL	MIPR	JHU/APL : Columbia, MD	3.336	6.126	Nov 2015	5.311	Nov 2016	7.793	Nov 2017	-		7.793	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD LM	C/CPFF	Lockheed Martin : Moorestown, NJ	3.375	5.447	Nov 2015	4.441	Nov 2016	7.922	Nov 2017	-		7.922	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD MIT	MIPR	Hanscom AFB - MIT/LL : Lexington, MA	3.085	2.744	Nov 2015	1.982	Dec 2016	3.169	Nov 2017	-		3.169	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD MITRE	MIPR	CECOM - MITRE : Dahlgren, VA	0.000	0.626	Nov 2015	0.338	Dec 2016	1.228	Nov 2017	-		1.228	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD NSWCCD	MIPR	NSWC DD : Dahlgren, VA	1.390	7.087	Nov 2015	7.236	Feb 2017	7.753	Nov 2017	-		7.753	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 Raytheon	SS/CPAF	Raytheon : AZ	0.857	0.730		0.000		0.825	Apr 2018	-		0.825	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09- Technology Design and Insertion-TD No longer funding in the FYDP	Various	Various, : Various	0.000	2.500	Nov 2015	9.232	Feb 2017	0.000		-		0.000	0	11.732	0
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - SPAWAR	MIPR	SPAWAR : San Diego, CA	0.000	0.322		0.000		5.255	Dec 2017	-		5.255	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Technology Design and Insertion - Discrimination	MIPR	Various - MDA : AL,VA	0.000	9.972	Nov 2015	0.000		6.000	Nov 2017	-		6.000	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Various - MDA	MIPR	Various - MDA : AL,VA,CA	0.000	2.471		1.805	Jan 2017	0.323	Nov 2017	-		0.323	Continuing	Continuing	Continuing
FY16 SM-3 Block IIA RDT&E All Up Rounds	MIPR	MIT/LL : MA	0.000	0.000		0.500	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
- FY 16 SM-3 Block IIA RDT&E All Up Rounds-MIT/LL															
FY16 SM-3 Block IIA RDT&E All Up Rounds - NSWC/DD	MIPR	NSWC/DD : Dahlgren, VA	0.000	0.000		1.500	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
FY16 SM-3 Block IIA RDT&E All Up Rounds - SM-3 MANUFACTURING - MD09	SS/CPAF	Raytheon : Tucson, AZ	355.473	115.948	Dec 2015	251.154	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
FY16 SM-3 Block IIA RDT&E All Up Rounds - Various	MIPR	Various : CA, VA, MD	0.000	0.000		1.500	Nov 2016	0.000		-		0.000	0	1.500	0
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering	Various	MDA : AL, VA	4.569	3.750	Nov 2015	4.269	Nov 2016	1.763	Nov 2017	-		1.763	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - CSS Support	C/CPFF	MiDAESS / TEAMS : AL, CO	13.510	2.588	Nov 2015	0.000		1.095	Nov 2017	-		1.095	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Engineering Support	C/CPAF	Northrop Grumman : CO	12.944	4.700	Nov 2015	6.222	Nov 2016	8.613	Nov 2017	-		8.613	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Integration	MIPR	AMRDEC : AL	12.108	4.347	Nov 2015	4.043	Nov 2016	4.318	Nov 2017	-		4.318	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Prime	C/CPFF	Teledyne Brown Engineering : AL, CO	66.649	24.761	Nov 2015	25.550	Nov 2016	21.352	Nov 2017	-		21.352	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering & Integration - Systems Engineering	Various	MDA Various : VA, AL	48.720	6.852	Nov 2015	6.787	Nov 2016	3.620	Oct 2017	-		3.620	Continuing	Continuing	Continuing
Systems Engineering & Integration - Systems Engineering - CSS	C/CPFF	MiDAESS / TEAMS : VA	13.003	1.224	Nov 2015	1.533	Nov 2016	0.945	Nov 2017	-		0.945	Continuing	Continuing	Continuing
Systems Engineering & Integration - Systems Engineering - Industry	C/CPAF	Boeing : VA	26.907	11.033	Nov 2015	11.085	Nov 2016	13.965	Nov 2017	-		13.965	Continuing	Continuing	Continuing
M&S BMDS Simulations & Tools - Sims & Tools	C/CPFF	Teledyne Brown Engineering : AL, CO	0.000	0.000		0.950	Nov 2016	1.243	Nov 2017	-		1.243	Continuing	Continuing	Continuing
M&S BMDS Simulations & Tools - Sims & Tools - Industry	C/CPAF	Northrop Grumman : CO	24.053	4.989	Nov 2015	4.028	Nov 2016	3.984	Nov 2017	-		3.984	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment	Various	MDA Various : AL, VA	0.000	0.000		0.000		0.709	Nov 2017	-		0.709	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - CSS Support	C/CPFF	MiDAESS / TEAMS : AL	4.720	3.852	Nov 2015	3.960	Nov 2016	2.210	Nov 2017	-		2.210	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - CSS Support (2)-No longer funding in the FYDP	C/CPFF	Sparta : AL	0.505	0.525	Nov 2015	0.555	Nov 2016	0.000		-		0.000	0	1.585	0
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - Industry	C/CPAF	Boeing : AL	1.075	6.914	Nov 2015	6.927	Nov 2016	6.165	Nov 2017	-		6.165	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment	MIPR	MITRE : VA	3.632	1.476	Nov 2015	1.539	Nov 2016	1.174	Nov 2017	-		1.174	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency											Date: May 2017				
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD					Project (Number/Name) MD09 / Aegis BMD				

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
(VV&A) - Verification & Assessment - Labs																
BMDs Verification, Validation & Assessment (VV&A) - Verification & Assessment - OGA	MIPR	AMRDEC : AL	5.095	7.957	Nov 2015	7.338	Nov 2016	7.432	Nov 2017	-		7.432	Continuing	Continuing	Continuing	
BMDs Verification, Validation & Assessment (VV&A) - Verification & Assessment - UARC	MIPR	GTRI : GA, AL	1.119	0.000		1.043	Nov 2016	1.100	Nov 2017	-		1.100	Continuing	Continuing	Continuing	
BMDs Verification, Validation & Assessment (VV&A) - Verification & Assessment - UARC2	MIPR	JHU/APL : AL, VA	0.000	0.000		0.000		1.429	Nov 2017	-		1.429	Continuing	Continuing	Continuing	
Subtotal			4,401.434	566.751		732.990		292.063		-		292.063	-	-	-	

Remarks

N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
Program Operations - MD09 - Civ Sal	MIPR	MDA : Arlington, VA	25.282	35.328	Oct 2015	34.746	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing	
Program Operations - MD09 - DD PM	MIPR	NSWC DD : Dahlgren, VA	7.017	7.632	Nov 2015	8.792	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing	
Program Operations - MD09 - IT	MIPR	MDA : Arlington, VA	0.181	0.519	Nov 2015	0.500	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing	
Program Operations - MD09 - MDA Travel	MIPR	MDA : Arlington, VA	1.610	2.065	Oct 2015	3.100	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing	
Program Operations - MD09 - MIDAESS	MIPR	MDA : Arlington, VA	43.352	54.219	Oct 2015	47.523	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing	

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Operations - MD09 - NAVSEA Civ Sal	MIPR	NAVSEA : Washington, DC	12.825	13.856	Oct 2015	12.503	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - MD09 - NAVSEA RB Sal	MIPR	NAVSEA : Washington, DC	1.161	2.109	Oct 2015	2.132	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - MD09 - NAVSEA Training, Various	MIPR	NAVSEA : Washington, DC	1.542	1.134	Oct 2015	0.771	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - MD09 - NAVSEA Travel	MIPR	NAVSEA : Washington, DC	1.027	1.056	Oct 2015	1.056	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - MD09 - Security	MIPR	Various : VA	1.165	1.603	Nov 2015	1.651	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - MD09-Program Operations- No longer funding in the FYDP	MIPR	Various : VA	13.730	0.264		0.264		0.000		-		0.000	0	14.258	0
Subtotal			108.892	119.785		113.038		0.000		-		0.000	-	-	-

Remarks
Remarks
*Increase from FY 2017 to FY 2018 (Lockheed Martin, NJ) due to detailed design of BMD 6.0 in preparation for CDR which will finalize the Baseline Program Performance requirements and Commencement of the BMD 6.1

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4,510.326	686.536	846.028	292.063	-	292.063	-	-	-

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, MIPRs, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
BMD 6.x SRR				◇																												
BL 5.3.x/BMD 4.x SDR/PDR								◇																								
BMD 5.1 Demo												△																				
BMD 6.x SFR								◇																								
BMD 5.1 Development	◇	◇	◇	◇	◇	◇	◇	◇																								
BMD 5.0 Ship Installations	◇	◇	◇	◇	◇	◇	◇	◇																								
BL 5.3.x/BMD 4.x CDR												◇																				
BMD 6.0 PDR												◇																				
BMD 5.1 Certification																△																
BMD 6.1 SRR												◇																				
BL 5.3.x/BMD 4.x EA																◇																
BMD 6.0 CDR																				◇												
BMD 6.1 SFR																								◇								
BL 5.3.x/BMD 4.x Certification																																☆
BMD 6.1 PDR																															◇	
BMD 6.0 Demo																																△
BMD 6.0 Certification																																☆
BMD 6.1 CDR																																◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD
--	---	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BMD 6.x SRR	4	2016	4	2016
BL 5.3.x/BMD 4.x SDR/PDR	2	2017	2	2017
BMD 5.1 Demo	3	2017	3	2017
BMD 6.x SFR	3	2017	3	2017
BMD 5.1 Development	1	2016	4	2017
BMD 5.0 Ship Installations	1	2016	4	2017
BL 5.3.x/BMD 4.x CDR	1	2018	1	2018
BMD 6.0 PDR	1	2018	1	2018
BMD 5.1 Certification	3	2018	3	2018
BMD 6.1 SRR	3	2018	3	2018
BL 5.3.x/BMD 4.x EA	1	2019	1	2019
BMD 6.0 CDR	2	2019	2	2019
BMD 6.1 SFR	3	2019	3	2019
BL 5.3.x/BMD 4.x Certification	4	2019	4	2019
BMD 6.1 PDR	1	2021	1	2021
BMD 6.0 Demo	2	2021	2	2021
BMD 6.0 Certification	2	2022	2	2022
BMD 6.1 CDR	2	2022	2	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MG09: Aegis BMD SM-3 Development Articles	-	0.000	0.000	253.276	-	253.276	166.129	73.523	18.291	0.000	0	511.219
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Reflects transfer of SM-3 Development Articles efforts from Project MD09, Aegis BMD beginning in FY 2018

A. Mission Description and Budget Item Justification

This project supports Aegis BMD purchase of Development Articles to use as test articles, and initial deployment in support of EPAA Phase III. Includes Manufacturing of SM-3 Block IIA All Up Round (AUR) for the purposes of flight testing and delivery to the fleet as operational assets, and to ensure the maturation of SM-3 Block IIA manufacturing process.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: FY16 SM-3 Block IIA RDT&E All Up Rounds	0.000	0.000	212.029
Articles:	-	-	-
Description: Manufacture FY 2016 SM-3 Block IIA All Up Rounds (AURs) for the purposes of flight testing and delivery to the fleet as operational assets prior to an initial production decision in support of EPAA Phase III.			
Recurring Accomplishment: Deliver SM-3 Block IIA AURs			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: FY16 SM-3 Block IIA RDT&E All Up Rounds efforts transferred from Project MD09, Aegis BMD. Decrease from FY 2017 to FY 2018 to match manufacturing schedule for incremental phasing of FY 2016 All-Up-Rounds. Continue funding for quantity 17 SM-3 Block IIA AURs (delivered FY 2018 through FY 2020) for use in flight test as reflected in the IMTP, and initial deployment of			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
EPAA Phase III. SM-3 Block IIA AURs validate the Engineering Manufacturing Readiness Level 3 criteria for an Initial Production Decision scheduled 4Q FY 2018.			
Title: FY18 SM-3 Block IIA RDT&E All Up Rounds	0.000	0.000	41.247
Articles:	-	-	-
Description: Purchase of FY 2018 SM-3 Block IIA AURs for delivery to the fleet as operational assets			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: In PB-2017 this requirement was captured in Aegis BMD MD09 Procurement account			
- Incremental funding of six SM-3 Block IIA AURs for flight testing and delivery to the fleet as operational assets - Ensure the maturation of SM-3 Block IIA manufacturing process and mitigate impacts of a production gap - All Up Rounds utilized to achieve Engineering Manufacturing Readiness Level 4			
Accomplishments/Planned Programs Subtotals	0.000	0.000	253.276

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks
D. Acquisition Strategy N/A
E. Performance Metrics N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency											Date: May 2017				
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD					Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles				

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FY16 SM-3 Block IIA RDT&E All Up Rounds - FY16 SM-3 Block IIA RDT&E All Up Rounds - IWS	MIPR	NAVSEA IWS : Washington DC	0.000	0.000		0.000		7.523	Nov 2017	-		7.523	Continuing	Continuing	Continuing
FY16 SM-3 Block IIA RDT&E All Up Rounds - FY16 SM-3 Block IIA RDT&E All Up Rounds - NSWC/DD	MIPR	NSWC/DD : Dahlgren, VA	0.000	0.000		0.000		2.000	Nov 2017	-		2.000	Continuing	Continuing	Continuing
FY16 SM-3 Block IIA RDT&E All Up Rounds - FY16 SM-3 Block IIA RDT&E All Up Rounds - SM-3 MANUFACTURING - MG09	SS/CPAF	Raytheon : Tuscon, AZ	0.000	0.000		0.000		202.506	Nov 2017	-		202.506	Continuing	Continuing	Continuing
FY18 SM-3 Block IIA RDT&E All Up Rounds - FY18 SM-3 Block IIA RDT&E All Up Rounds - FY18 SM-3 Manufacturing	MIPR	NAVSEA IWS : Washington DC	0.000	0.000		0.000		5.534	Nov 2017	-		5.534	Continuing	Continuing	Continuing
FY18 SM-3 Block IIA RDT&E All Up Rounds - FY18 SM-3 Block IIA RDT&E All Up Rounds - Raytheon	SS/CPAF	Raytheon : Tuscon, AZ	0.000	0.000		0.000		35.713	Jun 2018	-		35.713	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		253.276		-		253.276	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	253.276	-	253.276	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency							Date: May 2017			
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD			Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks N/A									
-----------------------	--	--	--	--	--	--	--	--	--

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles
--	---	--

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
FY16 SM-3 Block IIA AUR-first round delivery														
FY16 SM-3 Block IIA AUR EPAA Phase III Declaration														

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FY16 SM-3 Block IIA AUR-first round delivery	3	2018	3	2018
FY16 SM-3 Block IIA AUR EPAA Phase III Declaration	1	2019	1	2019

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MM09: Aegis BMD SM-3 Development	-	0.000	0.000	93.414	-	93.414	121.268	125.305	74.922	111.278	0	526.187
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Reflects transfer of SM-3 Development efforts from Project MD09, Aegis BMD in FY 2018

A. Mission Description and Budget Item Justification

Provides development of SM-3 Missiles, Upgrade Modifications, and Integration into the Aegis Weapon System. The SM-3 Block IB improves Aegis BMD's ability to expand the BMD battlespace, engage longer range, more sophisticated ballistic missiles that may deploy countermeasures and launch in larger raid sizes. The SM-3 Block IB Kinetic Warhead's (KW) two color infra-red (IR) seeker and advanced signal processor provides a real-time discrimination and characterization capability while improving sensitivity for longer range targets and performance against more sophisticated threats. Additionally, the new Throttleable Divert and Attitude Control System (TDACS) KW divert engine has been upgraded over the SM-3 Block IA to provide a more flexible divert in order to maneuver the KW to intercept.

The SM-3 Block IIA consists of an upgrade to a 21-inch diameter SM-3 missile and expands beyond the SM-3 Block IB battlespace to counter Intermediate Range Ballistic Missile (IRBM). SM-3 Block IIA provides an increased kinematic envelope through improved infa-red (IR) discrimination and divert capability that provide performance against the EPAA phase III expanded threat set. When combined with Aegis BMD 5.1 weapon system modifications, the SM-3 Block IIA will provide Engage on Remote (EoR) capability, which allows the use of remote off board sensor information to launch and guide the SM-3 Block IIA to final intercept. Aegis BMD 5.1 EoR capability with SM-3 Block IIA also frees up Radar resources and increases the number and type of threats to be engaged simultaneously over previous baselines.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Standard Missile-3 (SM-3) Block IB Development	0.000	0.000	21.148
Articles:	-	-	-
Description: This effort develops the SM-3 Block IB missile, which improves on the SM-3 Block IA performance and enables engagement of more sophisticated ballistic missiles and larger raid sizes.			
SM-3 Block IB Modernization will provide the following upgrades:			
- Upgraded SM-3 KW Common Avionics Package will provide improved producibility and reduced cost resulting from utilization of common components between SM-3 Block IIA and the Redesigned Kill Vehicle (RKV). SM-3 Block IB Common Components will be extendable to support different form/fit in circuit card assemblies across SM-3 Block IB, SM-3 Block IIA, and RKV and will mitigate SM-3 Block IB hardware availability issues.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<p>- Upgraded SM-3 Block IB Guidance Section (GS) will resolve Computer Processing Unit 3 and Plate 3A hardware availability issues, enable use of 5.1/IIA Target Object Map (TOM) and similar software to SM-3 Block IIA Mission Computer; and enable additional capability against complex threats.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans: Increase from FY 2017 to FY 2018 is due to SM-3 Block IB Modernization efforts to develop capabilities against future threats, resolve identified hardware availability issues and increase commonality within the SM-3 Missile family.</p> <p>SM-3 Block IB Modernization consists of two primary upgrade packages as follows:</p> <ul style="list-style-type: none"> - Initiate development of the upgraded SM-3 KW Common Avionics Package - Initiate development of the upgraded SM-3 Block IB Guidance Section (GS) 			
---	--	--	--

Title: Standard Missile-3 (SM-3) Block IIA Development	0.000	0.000	72.266
---	-------	-------	--------

Description: The SM-3 Block IIA is required to meet EPAA Phase III. It will increase the area that can be defended by Aegis BMD, increase the probability of kill against a larger threat set, and leverage enhanced capability provided by BMDS sensor upgrades.	-	-	-
--	---	---	---

<p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Conduct SM-3 Block IIA software update to support engagements against additional complex threats identified during Aegis BMD 5.1 design process conducted after missile Critical Design Review (CDR) - Conduct End to End Distributed Development System (ETEDDS) integration testing; and flight test support - Continue implementation of SM-3 Block IIA cost reduction initiatives to support meeting cost goals to reduce the current estimated Average Unit Production Price (AUPP) 			
--	--	--	--

FY 2016 Accomplishments: N/A			
FY 2017 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
N/A			
<i>FY 2018 Plans:</i> Decrease from FY 2017 to FY 2018 due to life cycle progression as program begins shift from development phase to initial production			
- Continue transition of Kinetic Warhead (KW) hardware commonality effort (from design to material purchases) to system integration testing in order to demonstrate technology readiness level 7			
- Conduct Engineering Manufacture Readiness Level (EMRL) 3 compliance to support life cycle progression			
- Support execution of robust Flight Test Mission Campaign Series to ensure six successful SM-3 Block IIA Intercepts			
Accomplishments/Planned Programs Subtotals	0.000	0.000	93.414

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MD09	SS/CPAF	Raytheon : Tuscon, AZ	0.000	0.000		0.000		17.146	Jan 2018	-		17.146	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MD09 - 20117142332259	MIPR	NSWC/PHD : Port Hueneme, CA	0.000	0.000		0.000		1.934	Nov 2017	-		1.934	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MD09 - Corona	MIPR	NSWC Corona : Corona, CA	0.000	0.000		0.000		2.068	Nov 2017	-		2.068	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - CA,VA, MD	MIPR	Various : CA, VA, MD	0.000	0.000		0.000		3.338	Nov 2017	-		3.338	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MD09 - SM-3 BLK IIA INTEGRATION	SS/CPIF	Raytheon : Tuscon, AZ	0.000	0.000		0.000		48.454	Nov 2017	-		48.454	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MD09 - SM-3 BLK IIA INTEGRATION - APL	MIPR	JHU/APL : Laurel, MD	0.000	0.000		0.000		12.994	Nov 2017	-		12.994	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development	MIPR	NSWC DD : Dahlgren, VA	0.000	0.000		0.000		5.053	Nov 2017	-		5.053	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
- MD09 - SM-3 BLK IIA INTEGRATION - DD															
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NSWCCOR	MIPR	NSWC Corona : Corona, CA	0.000	0.000		0.000		1.266	Nov 2017	-		1.266	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NSWCCOR	MIPR	NWSC/Crane : IN	0.000	0.000		0.000		1.161	Nov 2017	-		1.161	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		93.414		-		93.414	-	-	-

Remarks
Increase from FY 2017 to FY 2018 (Raytheon, AZ) due to implementation of SM-3 IB Modernization

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	93.414	-	93.414	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
Kinetic Warhead hardware commonality (also known as Guidance Electronic Unit Engineering Change Proposal (GEU ECP)) CDR							◇							
GEU ECP Host GEU delta-CDR								◇						
GEU ECP Qualification										◇				

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Kinetic Warhead hardware commonality (also known as Guidance Electronic Unit Engineering Change Proposal (GEU ECP)) CDR	1	2018	1	2018
GEU ECP Host GEU delta-CDR	1	2019	1	2019
GEU ECP Qualification	1	2020	1	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MC09 / Cyber Operations			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC09: <i>Cyber Operations</i>	1.700	1.225	0.879	2.340	-	2.340	14.970	22.506	23.079	20.177	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2017 to FY 2018 is attributed to "Increasing cybersecurity requirements following the Secretary of Defense DoD Cybersecurity Discipline guidance to implement strong authentication, device hardening, reducing the attack surface and alignment to cybersecurity network defense services providers.

A. Mission Description and Budget Item Justification

Sustain the DoD RMF Certification and Accreditation process and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Systems Security Manager (PM/ISSM).

This project supports the monitoring and tracking of Cybersecurity mitigation detailed in Information Technology Security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Authorizing Official (AO). Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the AB mission and non-mission systems, which includes test and remote site administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network / System Certification and Accreditation (C&A)	1.225	0.879	2.340
Articles:	-	-	-
Description: This accomplishment has reoccurring efforts. Conduct cybersecurity engineering and architecture requirements planning or Aegis BMD systems. Plan and test the Risk Management Framework (RMF) controls for Ballistic Missile Defense System (BMDS) in regards to Aegis BMD systems to comply with new directive, RMF for DoD Information Technology (DoDi 8510.01) to replace the DoD Information Assurance Certification and Accreditation process (DIACAP). In addition, conduct Controls Validation Testing (CVT).			
FY 2016 Accomplishments: Cyber security efforts were moved from MD09 to MC09 to match execution.			
FY 2017 Plans: SEE ABOVE			
FY 2018 Plans: Increase from FY 2017 to FY 2018 is attributed to increasing cybersecurity requirements and ensuring compliance of additional requirements			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MC09 / Cyber Operations

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Continue coordination and development of new and existing accreditation packages that comply with new directive, RMF for DoD Information Technology (DoDI 8510.01) process - Conduct regular Controls Validation Testing (CVT) and cooperative risk assessments to mitigate cybersecurity deficiencies - Develop and deploy Hardware and Software HW/SW implementation strategies for Continuous Monitoring activities at remote sites and Aegis BMD assets Monthly reviews of systems through the eMass -Daily management of eMass System Plan of Action and Milestones (POAMs)			
Accomplishments/Planned Programs Subtotals	1.225	0.879	2.340

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603882C: Ballistic Missile Defense Midcourse Defense Segment	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: Ballistic Missile Defense Sensors	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603896C: Ballistic Missile Defense Command and Control, Battle Management & Communication	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603898C: Ballistic Missile Defense Joint Warfighter Support	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
• 0603904C: Missile Defense Integration and Operations Center (MDIOC)	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0604878C: Aegis BMD Test	78.468	95.012	134.468	-	134.468	73.059	82.570	113.856	97.660	Continuing	Continuing
• 0604880C: Land Based SM-3 (LBSM3)	29.288	43.293	30.486	-	30.486	31.816	33.024	31.707	30.924	Continuing	Continuing
• 0604881C: AEGIS SM-3 Block IIA Co-Development	165.456	106.038	9.739	-	9.739	0.000	0.000	0.000	0.000	0	281.233
• 0901598C: Management HQ - MDA	35.871	31.160	29.947	-	29.947	28.024	27.269	27.878	28.450	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MC09 / Cyber Operations
--	---	---

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
------------------	----------------	----------------	-------------------------------	------------------------------	--------------------------------	----------------	----------------	----------------	----------------	-----------------------------------	-------------------

Remarks

D. Acquisition Strategy

Full and Open contract support through Missile Defense Agency Program Management Office.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MC09 / Cyber Operations
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C&A) - BOOZ ALLEN HAMILTON INC	C/CPIF	MDA : MCLEAN, VA	0.643	1.086	Nov 2015	0.644	Oct 2016	2.340	Nov 2017	-		2.340	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services	C/CPIF	Torch Technologies : Huntsville, AL	1.057	0.139	Nov 2015	0.235	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			1.700	1.225		0.879		2.340		-		2.340	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.700	1.225	0.879	2.340	-	2.340	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)																	
0400 / 4	PE 0603892C / AEGIS BMD	MC09 / Cyber Operations																	
Significant Event Complete ▲ Significant Event Planned △	Milestone Decision Complete ★ Milestone Decision Planned ☆	Element Test Complete ◆ Element Test Planned ◇																	
	System Level Test Complete ● System Level Test Planned ○	Complete Activity ◆ Planned Activity ◇																	
			FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022										
MC09 Cyber Operations			◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MC09 / Cyber Operations
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC09 Cyber Operations	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MX09 / Aegis BMD Development Support			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MX09: <i>Aegis BMD Development Support</i>	32.016	80.312	68.283	169.325	-	169.325	177.360	174.101	182.794	197.100	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2017 to FY 2018 reflects transfer of Program Operations from Project MD09, Aegis BMD.

A. Mission Description and Budget Item Justification

Aegis Ballistic Missile Defense (BMD), in accordance with negotiated agreements between the United States Navy and the Missile Defense Agency (MDA) has identified and segregated funding for Developmental Support of Aegis BMD specific elements resident aboard Aegis capable Navy ships. Computer Program Support consists of, but is not limited to, reviews of Technical Observation Reports (TORs) that are generated by ship crews during exercises or deployments, determination of root causes and preparation of Computer Program Change Request (CPCR) to correct TORs, updates to the in-service computer program to apply, test and certify multiple CPCRs, and tests installation of Aegis Weapon System (AN/SPY-radar/Fire Control System (FCS)) alignment updates as required. Aegis BMD provides support to Annual Integration Events (AIEs) to ensure any updated Aegis Combat System (ACS) computer programs do not degrade BMD equipped ships and provides distance and technical support for BMD equipped ships. Additionally, Aegis BMD continues to analyze the Ballistic Missile Defense System (BMDS) elements to ensure that any and all Aegis continues to work with Program Executive Office (PEO) Integrated Warfare Systems (IWS) and PEO Command, Control, Communications, Computers, & Intelligence (C4I), Aegis' Navy counterparts, in order to maintain common C4I top level requirements for all Aegis BMD Baselines.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Fleet Integration	10.980	6.552	9.257
Articles:	-	-	-
Description: Provide Fleet operations and mission support to enable the conduct of sustained BMD operations; advocate war fighter requirements and fleet feedback in baseline development and capability upgrades to Aegis BMD weapon system; provide analysis and Mission Planning support for Geographic Combatant Commanders for operational application of Maritime BMD capabilities; and provide BMD Capabilities Analysis and Exercise Support for Aegis BMD baselines under development or currently deployed in the Operational Fleet.			
Recurring Accomplishments:			
- Define, develop and review Joint and Fleet Doctrine for incorporation of Aegis BMD capability transition to warfighter and baseline acceptance into MDA Operational Capacity Baseline (OCB)			
- Research and define certification and warfighter acceptance requirements for Aegis BMD baselines to ensure successful capability delivery			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>- Develop Aegis BMD training simulations and scenarios to support shipboard training including BMD Qualification (BMDQ) and higher level exercises</p> <p>- Execute warfighter feedback process to enhance Aegis BMD functional capability development and influence future Aegis BMD requirements and support MDA Test Community and Combatant Commanders in BMD Exercises and Wargames</p> <p>FY 2016 Accomplishments: Beginning in FY 2016, transferred from Project MD09, Fleet Integration</p> <ul style="list-style-type: none"> - Provided In-service Engineering support to Aegis Ballistic Missile Defense (BMD) ships and resolve any identified issues - Provided leadership, engineering, and technical support to conduct Aegis BMD Combat System Readiness to resolve any identified issues - Responded to Fleet training, analysis, and operational integration of maritime capabilities as part of Aegis BMD installations, BMD operations and BMD events and resolved any interoperability issues - Provided reach back analytical support to the Combatant Commanders (COCOMs) for real world operations and resolved Aegis BMD ship readiness issues - Provided maintenance and updates for Force on Force Modeling and Simulation to ensure accurate characterization of capability is provided to the warfighter community - Prepared and coordinated training documents for new BMD baselines to ensure that operators were provided current BMD baseline material for training - Provided BMD specific training to BMD ships, COCOM, and Fleet Staffs to ensure full interoperability between Aegis BMD ships and Fleet staffs <p>FY 2017 Plans: Increase from FY 2016 to FY 2017 is due to transition of responsibility for Aegis Scenario Development System to Fleet Integration from Aegis BMD Weapon System Support. This system enables Aegis BMD shipboard training for developmental Aegis BMD baselines.</p> <ul style="list-style-type: none"> - Execute Aegis BMD capabilities analysis for Combatant Commanders and Fleet staffs <p>FY 2018 Plans: Increase from FY 2017 to FY 2018 is due to COCOM operational analysis to support and inform both regional and homeland defense design implementation for Aegis BMD ship capability. To include but not limited to the following:</p> <ul style="list-style-type: none"> - Provide analysis for Anti-Ship Ballistic Missile Defense - Provide analysis on parametric organic sensor sensitivity - Provide analysis on up-range ship/sensor support for LOR, EOR, and Cued engagements - Provide analysis on impacts of countermeasures 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Provide analysis on developing threats			
<p>Title: Infrastructure Upgrades</p> <p align="right">Articles:</p> <p>Description: This project includes Special Access Program (SAP) infrastructure labor to include Contractor Program Security Officers, Information Assurance Officers, and System Administrators that will oversee the data transfer efforts. Funds IT services in support of the Aegis RDT&E mission. This includes: IT help-desk services; portal and data services; records management; business automation services; and desktop and Special Purpose Processing Nodes (SPPNs) maintenance and licenses. In addition, funds will be used to replace critical IT infrastructure at end-of-life and to implement DoD mandated projects in support of the Joint Information Environment (JIE) initiative.</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - - Transfer necessary data between collateral and SAP environments to comply with Federal and DoD mandates (Cybersecurity and Joint Information Environment) - Configuration and data management to ensure Modeling and Simulation (M&S) and software builds are identical in collateral and SAP environment - Fund Aegis IT services such as IT help-desk services; portal and data services; records management; business automation services; and desktop and SPPN maintenance and licenses. - Fund critical end-of-life IT equipment replacements - Fund IT infrastructure upgrade planning and implementation efforts to accomplish DoD mandated IT projects (JIE and DoD CIO Information Resources Management (IRM) initiatives) <p>FY 2016 Accomplishments: Initiate new security efforts as directed by the Security Classification Guide (SCG) and the consolidation and realignment of funds from MD09, MD40 and MT09 for IT services in support of the Aegis RDT&E mission.</p> <p>SEE ABOVE</p> <p>FY 2017 Plans: Increase from FY 2016 to FY 2017 is attributed to additional security efforts as directed by the Security Classification Guide (SCG)</p> <p>SEE ABOVE</p> <p>FY 2018 Plans: - Provide standard IT core user services in support of the Aegis BMD RDT&E mission as follows:</p>	25.262	20.439	20.866
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - IT core services encompassing end user services including the Microsoft productivity suite including Microsoft Word, Excel, PowerPoint, Access and Lync - Public Key Enabling software such as Active Identity client software which enables secure workstations with smart cards to enforce strong authentication for network security - IT help-desk services, IT consumables, hardware break-fix, end-of-life equipment replacements and IT asset management. Access to the MDA business applications and portal services such as SharePoint for data management services and records management. It includes Unified Communications services such as telephony, wireless services and Video Conferencing capabilities - Provide security support, network administration, performance monitoring, and technical support for SAP infrastructures and computing suites 			
<p>Title: Aegis Ballistic Weapon System Support</p> <p align="right">Articles:</p>	44.070	41.292	34.999
<p>Description: This project provides Command, Control, Computer, Communications and Intelligence (C4I) systems engineering for the development and fielding of Aegis Ballistic Missile Defense (BMD) communications systems which includes Aegis BMD and BMDS interoperability, integration of space and joint sensors systems with Aegis BMD and Aegis BMD baseline certifications; IAMD planning; and maintaining Top Level Requirements (TLR) between the Missile Defense Agency and the Navy. It also provides Aegis BMD Mission and Quality Assurance, supporting assessment of flight test readiness and ensuring identification of root causes of failures/non conformances and sufficiency of corrective actions.</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Monitor and address Fleet feedback concerns raised during waterfront technical exchanges and ship visits - Update threat adaptation data to keep pace with emergent threats - Provide support for contingency operations of National interest - Support the fielded Aegis BMD computer programs baselines approved as an Operational Capability Baseline - Provide engineering support to Operationally Capable Baseline ships that participate in BMD test events - Perform system troubleshooting and maintenance as required for Aegis BMD related systems - Provide preventative and corrective maintenance services and upgrades in support of Aegis BMD systems and associated support systems <p>FY 2016 Accomplishments: Computer Program Development Support efforts transferred from Project MX09, Aegis BMD Operations and Support</p>	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>- Conducted (C4I) systems engineering for the development of Aegis BMD requirements, analysis of development efforts by other BMDS element for potential Aegis BMD interoperability issues, and resolve identified interoperability problems</p> <p>- Implemented C4I systems for operational deployment by Aegis BMD ships and elements</p> <p>- Maintained C4I Top Level Requirements (TLRs) for development of systems supporting command and control, and communications equipment between Navy and MDA Program Executive Offices</p> <p>- Certified Deterministic Routing for Aegis Ashore and Aegis BMD ships, including development of Concepts of Operation (CONOPS), and Tactics for use of this capability, and deployment of operational assets</p> <p>- Conducted Navy and Joint Link certifications required for BMD Baseline certifications for operational deployment</p> <p>- Certified overhead satellite data sources to meet Aegis BMD fire control capabilities in support of dual path requirement in Aegis BMD 5.1</p> <p>- Developed and implemented collaborative IAMD planning tools to ensure effective Strategic Homeland, Regional, and Theater Aegis BMD employment</p> <p>- Implemented and managed C4I aspects of the BMDS Test Site (BTS) San Diego upgrade plan to maintain fleet representative C4I configurations to support testing, troubleshooting, and Fleet operations</p> <p>- Conducted Mission and Quality Assurance (QA) reviews for failures and non-conformance for the SM-3 Block IIA</p> <p>- Conducted test event analysis to investigate Technical Observation Reports (TORs) and BMDS Deficiency Reports (BDRs)) in order to provide an engineering solution for impacts to Aegis BMD capabilities</p> <p>- Developed Computer Program Change Requests (CPCRs) and determine appropriate baseline for insertion</p> <p>FY 2017 Plans: Decrease in funding from FY 2016 to FY 2017 is due to:</p> <p>-Completion of Operational Testing for BMD 3.6 and BMD 4.0 transferred computer program sustainment activities for these baselines to Operations & Maintenance appropriation</p> <p>FY 2017 requirement supports:</p> <p>- Prior to completion of operational testing, sustain Aegis BMD computer program baseline variants of Baseline 9 Common Source Library (CSL)</p> <p>- Provide one Baseline 9 maintenance build</p> <p>- Sustain the Beowulf classified computing infrastructure</p> <p>- Sustain the Automated Test and Analysis (ATA) / Automated Test and Retest (ATRT) tool</p> <p>- Provide test site usage for maintenance and support of baselines under development</p> <p>- Provide C4I Systems Engineering for the development of requirements, analysis of BMDS elements, and interoperability</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Certify Deterministic Routing of Aegis Ashore and Aegis BMD including Concepts of Operations(CONOPS)/Tactics, Techniques, and Procedures (TTP) - Implement and certify BMD capabilities in C4I systems - Conduct Navy and Joint Link certifications required for BMD baseline certifications - Certify Overhead Persistent Infrared (OPIR) for dual path requirement in BMD 5.1 - Develop and implement IAMD planning capabilities and BMD collaborative planning concepts - Provide FFRDC) and URDC evaluation of technical proposals and proposed technical solutions by small industry business partners; Provide feasibility analysis of proposed solutions and testing of hardware prototypes - Facilitate preliminary integration efforts to incorporate Space Based Infrared Systems (SBIRS) and Future Naval Capability (FNC) projects into Aegis BMD architecture <p>FY 2018 Plans: Decrease from FY 2017 to FY 2018 is due to completion of BMD 5.x efforts</p> <ul style="list-style-type: none"> - Conduct Common Source Library fair share support for maintenance of Baseline 9 computer program variants - Conduct test event analysis to investigate Technical Observation Reports (TORs) and BMD Deficiency Reports (BDRs) in order to provide an engineering solution for impacts to Aegis BMD capabilities - Monitor and address Fleet feedback concerns raised during waterfront technical exchanges and ship visits - Update threat adaptation data to keep pace with emergent threats - Conduct system engineering and maintenance for the Beowulf Data Center. This effort also includes security, Information Assurance (IA), systems administration, performance monitoring and technical support for the classified and unclassified network infrastructure supporting Aegis BMD program environments and activities -Provide operation and maintenance of land based test sites used for the development of Aegis BMD baselines. Operation and maintenance includes Quality Assurance, Configuration Management and other support activities to both baseline development and the sites. Engineering, logistic, quality assurance, configuration management and administrative support for the operation and maintenance of the Aegis shore sites and centers in support of the delivery of BMD baselines 			
<p>Title: Program Operations</p> <p align="right">Articles:</p> <p>Description: This activity funds the Government, contractor, and Federally Funded Research and Development Center (FFRDC) workforce that manage the overall Aegis Ballistic Missile Defense (BMD) program and enables the program to develop, build, and test standard missiles and the associated Aegis Weapon Systems. This project includes all operations support for the Aegis program office in Engineering, Testing, Logistics, Acquisition, Safety, Quality Assurance, Finance, Budget Formulation and Execution, Cost Estimation, and Earned Value Management in support of development activities.</p> <p>FY 2016 Accomplishments:</p>	0.000 -	0.000 -	104.203 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
N/A			
<i>FY 2017 Plans:</i> N/A			
<i>FY 2018 Plans:</i> Reflects transfer of Program Operations from Project MD09, Aegis BMD. Decrease from FY 2017 to FY 2018 reflects cost savings attained through consolidation of contractor tasks and efforts performed in support of the Aegis program.			
Accomplishments/Planned Programs Subtotals	80.312	68.283	169.325

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018		FY 2019	FY 2020	FY 2021	FY 2022	Cost To		
			Base	OCO					Total	Complete	Total Cost
• 0604878C: Aegis BMD Test	78.468	95.012	134.468	-	134.468	73.059	82.570	113.856	97.660	Continuing	Continuing
• 0604880C: Land Based SM-3 (LBSM3)	29.288	43.293	30.486	-	30.486	31.816	33.024	31.707	30.924	Continuing	Continuing
• 0604881C: AEGIS SM-3 Block IIA Co-Development	165.456	106.038	9.739	-	9.739	0.000	0.000	0.000	0.000	0	281.233

Remarks

D. Acquisition Strategy

The Aegis Ballistic Missile Defense (BMD) element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall Ballistic Missile Defense System (BMDS) capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the Standard Missile-3 (SM-3) and the Aegis BMD Weapon System, respectively.

Competition will be maximized for purchase of any products or services as appropriate.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Fleet Integration - MX09 - Fleet APL	C/CPAF	JHU/APL/MD : Columbia, MD	0.000	6.192	Nov 2015	1.681	Nov 2016	4.746	Nov 2017	-		4.746	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet DD	MIPR	NSWC DD : Dahlgren, VA	0.000	2.913	Nov 2015	2.863	Nov 2016	2.979	Nov 2017	-		2.979	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet PHD	MIPR	NSWC PHD : Port Huenmene	0.000	0.432	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet SMDC	MIPR	SMDC/ARSTRST : Huntsville, AL	0.000	0.369	Nov 2015	0.529	Nov 2016	0.468	Nov 2017	-		0.468	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet CSCS	MIPR	CSCS : Dahlgren, VA	0.000	1.074	Nov 2015	1.479	Nov 2016	1.064	Nov 2017	-		1.064	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - ICT Funding	SS/CPAF	Northrop Grumman : AL,CA,CO,NM,VA,HI	0.000	11.832	Oct 2015	9.771	Oct 2016	13.282	Nov 2017	-		13.282	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S APL	SS/CPAF	JHU/APL : Laurel, MD	0.000	0.400	Nov 2015	0.650	Nov 2016	0.700	Nov 2017	-		0.700	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S Corona	MIPR	NSWC Corona : Corona, CA	0.000	0.630	Nov 2015	1.000	Nov 2016	1.000	Nov 2017	-		1.000	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S LM	C/CPAF	Lockheed Martin : Moorestown, NJ	0.928	7.900	Nov 2015	2.410	Nov 2016	2.356	Nov 2017	-		2.356	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S MIT	C/CPAF	MIT : Lexington, MA	0.000	0.120	Nov 2015	0.200	Nov 2016	0.200	Nov 2017	-		0.200	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S RMS	C/CPAF	Raytheon : Tucson, AZ	0.000	3.720	Nov 2015	2.100	Nov 2016	2.100	Nov 2017	-		2.100	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09- D	MIPR	SPAWAR : CA	0.000	0.000		3.598	Jan 2017	0.426	Nov 2017	-		0.426	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Infrastructure Upgrades - MX09- S DD	MIPR	NSWC DD : Dahlgren, VA	0.949	0.660	Nov 2015	0.710	Nov 2016	0.802	Nov 2017	-		0.802	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW APL	SS/CPFF	JHU/APL : Columbia, MD	2.890	0.900	Nov 2015	0.945	Nov 2016	0.981	Nov 2017	-		0.981	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW DD	MIPR	NSWC DD : Dahlgren, VA	8.991	5.000	Nov 2015	3.156	Nov 2016	3.277	Nov 2017	-		3.277	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW LM	C/CPFF	Lockheed Martin : Moorestown, NJ	10.740	12.000	Nov 2015	8.856	Nov 2016	9.196	Nov 2017	-		9.196	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW NAVSEA	MIPR	NAVSEA : Washington, DC	0.863	12.780	Nov 2015	17.953	Nov 2016	18.644	Nov 2017	-		18.644	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW SSCPAC	MIPR	SPAWAR : San Diego, CA	0.000	2.390	Nov 2015	0.000		1.520	Nov 2017	-		1.520	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW TECH REP	MIPR	Tech Rep : Moorestown, NJ	0.000	0.600	Nov 2015	0.345	Nov 2016	0.358	Nov 2017	-		0.358	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW Wallops	MIPR	SCSC : Wallops Island, VA	0.000	2.000	Nov 2015	0.299	Nov 2016	0.310	Nov 2017	-		0.310	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - D	MIPR	MDA : Arlington, VA	0.000	1.037	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - IH	MIPR	NSWC Indian Head : MD	0.249	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - Raytheon	SS/CPAF	Raytheon : AZ	5.644	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD Corona	MIPR	NSWC Corona : Corona, CA	0.762	0.240	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aegis Ballistic Weapon System Support - MX09 - TD JHU/APL	SS/CPFF	JHU/APL : Columbia, MD	0.000	0.750	Nov 2015	0.906		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD MITRE	MIPR	CECOM - MITRE : Dahlgren, VA	0.000	0.900	Nov 2015	1.328		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD NSWC DD	MIPR	NSWC DD : Dahlgren, VA	0.000	0.820	Nov 2015	1.110		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD PHD	MIPR	NSWC PHD : Port Hueneme, CA	0.000	0.250	Nov 2015	0.319		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD SSCPAC	MIPR	SPAWAR : San Diego, CA	0.000	3.903	Nov 2015	5.388		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW PHD	MIPR	NSWC PHD : Port Hueneme, CA	0.000	0.500	Nov 2015	0.687	Nov 2016	0.713	Nov 2017	-		0.713	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - Civ Sal	MIPR	MDA : Arlington, VA	0.000	0.000		0.000		35.358	Nov 2017	-		35.358	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - DD PM	MIPR	NSWC DD : Dahlgren, VA	0.000	0.000		0.000		4.932	Nov 2017	-		4.932	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - IT	MIPR	MDA : Arlington, VA	0.000	0.000		0.000		1.402	Nov 2017	-		1.402	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - MDA Travel	MIPR	MDA : Arlington, VA	0.000	0.000		0.000		2.165	Nov 2017	-		2.165	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - MIDAESS	MIPR	MDA : Arlington, VA	0.000	0.000		0.000		40.197	Nov 2017	-		40.197	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Operations - MD09 - NAVSEA Civ Sal	MIPR	NAVSEA : Washington, DC	0.000	0.000		0.000		13.691	Nov 2017	-		13.691	Continuing	Continuing	Continuing
Program Operations - MD09 - NAVSEA RB Sal	MIPR	NAVSEA : Washington, DC	0.000	0.000		0.000		2.225	Nov 2017	-		2.225	Continuing	Continuing	Continuing
Program Operations - MD09 - NAVSEA Training, Various	MIPR	NAVSEA : Washington, DC	0.000	0.000		0.000		1.526	Nov 2017	-		1.526	Continuing	Continuing	Continuing
Program Operations - MD09 - NAVSEA Travel	MIPR	NAVSEA : Washington, DC	0.000	0.000		0.000		1.056	Nov 2017	-		1.056	Continuing	Continuing	Continuing
Program Operations - MD09 - Security	MIPR	Various VA : VA	0.000	0.000		0.000		1.651	Nov 2017	-		1.651	Continuing	Continuing	Continuing
Subtotal			32.016	80.312		68.283		169.325		-		169.325	-	-	-

Remarks

N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support
--	---	--

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	32.016	80.312	68.283	169.325	-	169.325	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>	Project (Number/Name) MX09 / <i>Aegis BMD Development Support</i>
--	--	---

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆																					
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇																					
					FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022		
MX09 Aegis BMD Development Support					◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MX09 Aegis BMD Development Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD40 / Program-Wide Support			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: Program-Wide Support	195.796	36.138	43.876	41.634	-	41.634	40.306	37.335	32.153	33.815	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016, Program Wide Support (PWS) reflects a proportional change as a result of decreases in BMD Aegis and in FY 2017, reflects a proportional change as a result of increases in BMD Aegis. FY 2018 reflects a proportional change as a result of decreases in BMD Aegis. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	36.138	43.876	41.634
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	36.138	43.876	41.634

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

NA

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance SRM (MIPR)	MIPR	Various : Multi: AL, CO, CA, VA, AK	0.174	0.000		1.220	Jan 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	1.353	0.199		0.876	Jul 2017	0.833	Jul 2018	-		0.833	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations User Services	C/CPAF	Various/Multi: AL, CA, CO, : NM, VA, various	0.623	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries	Allot	MDA : Multi: AK, AL, CO, CA, VA	134.181	28.734	Nov 2015	36.828	Nov 2016	37.906	Nov 2017	-		37.906	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK/AL/CA/CO/HI/MD/VA/NJ/NY/OCONUS	30.979	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	26.306	6.961	Nov 2015	4.705	Aug 2017	2.895	Aug 2018	-		2.895	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support, International, and materiel and Readiness	MIPR	Naval Surface Warfare Center : AL, VA	1.123	0.244	Mar 2016	0.247	Mar 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	MIPR	Various : Multi: AL, CA, CO, VA	1.057	0.000		0.000		0.000		-		0.000	1.615	2.672	0
Subtotal			195.796	36.138		43.876		41.634		-		41.634	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	195.796	36.138	43.876	41.634	-	41.634	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
--	-------------	---------	---------	--------------	-------------	---------------	------------------	------------	--------------------------

Remarks N/A									
-----------------------	--	--	--	--	--	--	--	--	--

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆																
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 5%;">FY 2016</th> <th style="width: 5%;">FY 2017</th> <th style="width: 5%;">FY 2018</th> <th style="width: 5%;">FY 2019</th> <th style="width: 5%;">FY 2020</th> <th style="width: 5%;">FY 2021</th> <th style="width: 5%;">FY 2022</th> </tr> </thead> <tbody> <tr> <td>MD40 Program-Wide Support</td> <td>◇</td><td>◇</td><td>◇</td><td>◇</td><td>◇</td><td>◇</td><td>◇</td> </tr> </tbody> </table>						FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	MD40 Program-Wide Support	◇	◇	◇	◇	◇	◇	◇
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022													
MD40 Program-Wide Support	◇	◇	◇	◇	◇	◇	◇													

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	700.925	27.262	32.129	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
MD12: <i>Space Tracking and Surveillance System (STSS)</i>	693.505	25.892	30.751	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	7.420	1.370	1.378	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond was transferred to PE 1206893C to aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

A. Mission Description and Budget Item Justification

The two Space Tracking and Surveillance System (STSS) satellites launched in 2009 provide an on-orbit capability to validate remote sensor fire control integration to inform design and operation of future Missile Defense Agency (MDA) space-layer capabilities. MDA uses STSS data to characterize contribution of space data into the BMDS and to provide sensor measurements and background data supporting trade studies and analyses for future MDA space-layer options for both Homeland and Regional Defense.

STSS continues to provide risk reduction for future MDA space capabilities, models, algorithms, interface definitions, communications architectures, and performance across threat object acquisition, tracking, complex target signatures, discrimination and multi-mission support. STSS also informs the Ballistic Missile Defense System (BMDS) Concept of Operations, timelines and performance requirements for remote space sensor cuing for ballistic missile engagements, expanding battle space for weapon systems such as Aegis BMD.

The STSS program demonstrates the functions and interfaces required for space data delivery to the BMDS, validating the data quality necessary for interceptors to launch and/or engage on STSS sensor data. The two STSS satellites are operated from the ground station processing center at the Missile Defense Space Center (MDSC). The STSS satellites demonstrate MDA space-layer capabilities and reduce risk for future systems by viewing high-value Targets of Opportunity and participating in BMDS flight tests.

The MDSC provides MDA's only centralized collaboration and integration environment that leverages existing Overhead Persistent Infrared (OPIR) enterprise integration in support of BMDS research and development test, and sensor operations. The MDSC capabilities and infrastructure support flight tests, operational concept and prototype development, technology demonstrations, experiments, and algorithm development within a multi-security, collaborative environment to integrate and exploit national space asset data. The MDSC also conducts studies and experiments with MDA assets such as the Spacebased Kill Assessment (SKA), and STSS, as well as other agencies' assets.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	28.605	32.129	33.869	-	33.869
Current President's Budget	27.262	32.129	0.000	-	0.000
Total Adjustments	-1.343	0.000	-33.869	-	-33.869
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.722	0.000			
• SBIR/STTR Transfer	-0.621	0.000			
• Other Adjustment	0.000	0.000	-33.869	-	-33.869

Change Summary Explanation

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>				Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD12: <i>Space Tracking and Surveillance System (STSS)</i>	693.505	25.892	30.751	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

A. Mission Description and Budget Item Justification

Two Space Tracking and Surveillance System (STSS) satellites provide a low earth orbit sensor capability with visible and infrared sensors for integrated testing with other BMDS elements. STSS demonstrates space-based capabilities including persistent tracking and integrated BMDS discrimination improvements. These two satellites provide valuable risk reduction for acquisition, tracking, complex scenes, and discrimination functionality to include stereo data fusion, cueing radars over the horizon and over-the-horizon fire control.

The on-orbit sensors collect invaluable background, scene and target signatures to support future MDA space-layer and other weapon sensor development trade studies. STSS activities provide information for integration of space-based missile tracking (midcourse phase); remote sensor and weapons cueing via the Command and Control, Battle Management and Communications (C2BMC); features and discrimination; and hit/impact point assessments. STSS enables early capability assessment to address the Warfighter's need for highly available early missile tracking from space, providing an operationally suitable means of global persistent surveillance and engagement. Capabilities being assessed for future MDA space-layer capabilities include detecting and acquiring ballistic missiles; tracking ballistic missiles and their deployed objects; performing autonomous acquisition-to-track handover within a satellite; performing tracking handover to a satellite from a ground cue; performing uplink and downlink of mission, health, and status data both directly and via crosslink between two satellites; reporting ballistic missile and intercept event to close the fire-control loop; filtering reports to C2BMC; and providing near real-time object data to external users. STSS support to other mission areas improves definition for future Enterprise system approaches.

The Missile Defense Space Center (MDSC) provides capabilities and infrastructure to support space operations, integration and testing with the BMDS. It provides a multi-level security environment for sensor data management and integration across space and terrestrial sensor data activities. MDSC experiments leverage DoD and national security space capabilities. MDSC activities support analysis, demonstration and integration of space sensor capabilities into developmental and operational MDA elements. MDSC enables the development of advanced technology and algorithms including fusion of multiple sensor types (radar, overhead persistent infrared, electro-optical and other emerging sensor technologies). It also supports mission integration of space-based missile tracking, sensor and weapons cueing via C2BMC, features and discrimination, kill and impact point assessments into the BMDS and other non-MDA mission areas, including Space Situational Awareness, technical intelligence, and battle space characterization. This effort is a continuation of work previously performed in program element 0603895C that supported the STSS program.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>

Lessons learned and data gathered from the STSS demonstration satellites program provide valuable information for future MDA space-layer modeling and simulation activities in assessing the capability provided by Overhead Persistent Infrared sensors.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Demonstration Satellites	25.892	30.751	0.000
Articles:	-	-	-
<p>Description: The Space Tracking and Surveillance System (STSS) demonstration satellites collect and deliver critical space and missile characterization data used to design and inform the BMDS and space-layer future capabilities. The Missile Defense Space Center (MDSC) facilities and activities are required for safe STSS satellite operations and sustainment</p> <p>STSS activities include:</p> <ul style="list-style-type: none"> - Perform risk reduction for future MDA tracking and surveillance initiatives and Overhead Persistent Infra-red (OPIR) Enterprise integration and demonstrations across OPIR cueing, Joint Tasking Operations, and data utility - Collect data to support joint OPIR mission utility assessments across Space Situational Awareness, Battle Space Awareness, and Technical Intelligence missions to include integration, analysis, and studies to confirm data sharing capabilities - Participate in Integrated Master Test Plan events - Conduct satellite testing to demonstrate critical space capabilities, including: <ul style="list-style-type: none"> -- Ability to support BMDS integrated discrimination efforts -- Ability to support Hit/Kill assessment from space -- Ability to cue BMDS sensors from space -- Ability to provide precision cue to BMDS sensors - Perform satellite functionality testing and calibration as part of the satellite operations - Conduct missile tracking experiments as identified in the test specific sections - Provide Air Force Space Command Space Situational Awareness support <p>MDSC efforts related to STSS include:</p> <ul style="list-style-type: none"> - Analyze space radiation environment and its influence on MDA space system performance - Analyze space based sensor data from STSS and OPIR observations, both individually and combined, to identify phenomenology and techniques to aid future tracking and discrimination architectures - Provide data for concept studies and analysis for alternative sensor payload configurations - Sustain MDSC resources for all participant activities, including data, voice, and/or video communications, and support MDA Cyber Security directives - Document requirements and perform tracking, design, implementation, and verification necessary for the MDSC facility - Implement emerging cyber security requirements 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> - Conducted STSS and MDSC activities listed in Description section (above)</p> <p><i>FY 2017 Plans:</i> - Conduct STSS and MDSC activities listed in Description section (above)</p> <p><i>FY 2018 Plans:</i> In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C.</p>			
Accomplishments/Planned Programs Subtotals	25.892	30.751	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	21.040	20.690	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>

D. Acquisition Strategy

The Space Tracking and Surveillance System (STSS) demonstration satellites program follows MDAs capability-based acquisition strategy that emphasizes testing, incremental development, and evolutionary acquisition. The STSS effort utilizes a single prime contractor, Northrop Grumman Aerospace Systems (NGAS), formerly known as Northrop Grumman Space Technology (NGST), with the subcontractor Raytheon providing the sensor payload. This contract implements MDA's capability-based acquisition strategy by using existing satellite hardware as a low risk opportunity, building upon the lessons learned from previous development efforts, and establishing a series of planned enhancements to bring added capability to the BMDS.

Functions and operations of the Missile Defense Space Center (MDSC) were financed through a 10-year MDSC Joint National Integration Center Research and Development Contract Services Contract (JRDC). The sole-source contractor, Northrop Grumman Information Systems, was responsible for integrating Research, Development, Test and Evaluation, operations support, and resource and infrastructure management for the MDSC, providing customer support, while achieving efficiencies through approaches that meet or exceed customer requirements. This contract concludes in FY17.

Follow-on MDSC efforts will be acquired on the Integrated Research and Development for Enterprise Solutions (IRES) contract vehicle. This contract is responsible for integrating Research, Development, Test and Evaluation, operations support, resource and infrastructure management for the MDSC. Through various uses of incentives upon the requirement objectives, the contractor provides customer support while striving to achieve efficiencies through approaches that meet or exceed customer requirements.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstration Satellites - Capability Based R&D	SS/CPAF	NGAS : Redondo Beach, CA, Schriever AFB, CO	569.126	16.514	Oct 2015	19.101	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration Satellites - STSS Support to Missile Defense Space Center (MDSC)	SS/CPAF	NGIS/TBD : Schriever AFB, CO	18.588	2.660	Jan 2016	3.763	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration Satellites - Systems Engineering	FFRDC	Aerospace : Los Angeles CA, Schriever AFB CO	52.276	0.404	Jan 2016	0.263	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			639.990	19.578		23.127		0.000		-		0.000	-	-	-

Remarks
 Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.
 All efforts listed above will continue in PE 1206893C, project MD12

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstration Satellites - Contract Support Services (CSS)	C/Variou	MDA : AL, CO	19.203	2.843	Oct 2015	3.106	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration Satellites - IT User Services	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.551	0.496	Jan 2016	0.439	Dec 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration Satellites - MDA Civilian	Allot	MDA : Schriever AFB, CO	10.785	2.085	Oct 2015	3.146	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration Satellites - Other Government Agency (OGA) Civilian	MIPR	SMC : Schriever AFB, CO	11.546	0.315	Oct 2015	0.316	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstration Satellites - Program Mission Support	Various	Various : Various	11.065	0.209	Oct 2015	0.250	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Demonstration Satellites - UARC	C/CPFF	Utah University, Space Dynamics Laboratory : AL, AK, CA, CO, HI, MA, UT, VA	0.365	0.366	Nov 2015	0.367	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			53.515	6.314		7.624		0.000		-		0.000	-	-	-

Remarks
 Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.
 All efforts listed above will continue in PE 1206893C, project MD12

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
 N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
 N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency							Date: May 2017						
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>				Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>						
	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	693.505	25.892		30.751		0.000		-		0.000	-	-	-

Remarks
 Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	---	---

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2016	▲																															
AA CTV-02 (FTO-02 E1a CTV) AEGIS AA, Intercept Only Flight Test)	▲																															
STSS Demonstration Satellites On-Orbit Operations - 1Q2016-4Q2016	◆	◆	◆	◆																												
MIS Operations - 1Q2016-4Q2016	◆	◆	◆	◆																												
Mission Planning, Tasking and Analysis - 1Q2016-4Q2016	◆	◆	◆	◆																												
MDSC TIL Operations - 1Q2016-4Q2016	◆	◆	◆	◆																												
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2016		▲																														
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2016			▲																													
GM CTV-02 Plus (GM, Intercept Flight Test)		▲																														
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2016				▲																												
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2017							△																									
FTX-21 (AEG IS SBT, Target Only Flight Test)			◆																													
STSS Demonstration Satellites On-Orbit Operations - 1Q2017-4Q2017							◇	◇	◇	◇																						
MIS Operations - 1Q2017-4Q2017							◇	◇	◇	◇																						
Mission Planning, Tasking and Analysis - 1Q2017-4Q2017							◇	◇	◇	◇																						
MDSC TIL Operations - 1Q2017-4Q2017							◇	◇	◇	◇																						
SFTM-01 (AEGIS 5.1, Intercept Flight Test)							△																									
FTG-15 (GM, Intercept Flight Test)								△																								
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2017								△																								
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2017									△																							
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2017										△																						
SFTM-02 (AEGIS 5.1, Intercept Flight Test)									△																							
FTT-18 (TH, Intercept Flight Test)									△																							
FTT-15 (TH, Intercept Flight Test)									△																							

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017					
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>				Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>			
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆							
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇							
					FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
FTM-24 (AEGIS 5.0, Intercept Flight Test)									△		

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2016	1	2016	1	2016
AA CTV-02 (FTO-02 E1a CTV) AEGIS AA, Intercept Only Flight Test)	1	2016	1	2016
STSS Demonstration Satellites On-Orbit Operations - 1Q2016-4Q2016	1	2016	4	2016
MIS Operations - 1Q2016-4Q2016	1	2016	4	2016
Mission Planning, Tasking and Analysis - 1Q2016-4Q2016	1	2016	4	2016
MDSC TIL Operations - 1Q2016-4Q2016	1	2016	4	2016
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2016	2	2016	2	2016
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2016	3	2016	3	2016
GM CTV-02 Plus (GM, Intercept Flight Test)	2	2016	2	2016
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2016	4	2016	4	2016
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2017	1	2017	1	2017
FTX-21 (AEG IS SBT, Target Only Flight Test)	3	2016	3	2016
STSS Demonstration Satellites On-Orbit Operations - 1Q2017-4Q2017	1	2017	4	2017
MIS Operations - 1Q2017-4Q2017	1	2017	4	2017
Mission Planning, Tasking and Analysis - 1Q2017-4Q2017	1	2017	4	2017
MDSC TIL Operations - 1Q2017-4Q2017	1	2017	4	2017
SFTM-01 (AEGIS 5.1, Intercept Flight Test)	2	2017	2	2017
FTG-15 (GM, Intercept Flight Test)	3	2017	3	2017
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2017	2	2017	2	2017
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2017	3	2017	3	2017
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2017	4	2017	4	2017
SFTM-02 (AEGIS 5.1, Intercept Flight Test)	3	2017	3	2017

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
FTT-18 (TH, Intercept Flight Test)	3	2017	3	2017
FTT-15 (TH, Intercept Flight Test)	3	2017	3	2017
FTM-24 (AEGIS 5.0, Intercept Flight Test)	3	2020	3	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	7.420	1.370	1.378	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 In FY 2016 and FY 2017, Program Wide Support reflects proportional changes as a result of decreases to the Space Tracking and Surveillance System program. Beginning in FY 2018, Program Wide Support was proportionately reallocated as a result of the Space Tracking and Surveillance System 0603293C transfer to Space Tracking and Surveillance System 1206893C program element.

A. Mission Description and Budget Item Justification
 PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	1.370	1.378	0.000
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	1.370	1.378	0.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO,	0.387	0.198		0.030	Jul 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK/AL/CO/CA/HI/MD/VA/NJ/NY/OCONUS	1.062	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Northrop Grumman : CO	5.971	1.172	Jan 2016	1.348	Aug 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			7.420	1.370		1.378		0.000		-		0.000	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.420	1.370	1.378	0.000	-	0.000	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆														
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇														
					FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
MD40 Program-Wide Support					◇	◇	◇	◇	◇	◇	◇	◇						

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603893C / <i>Space Tracking and Surveillance System</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2017

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	5.044	21.040	20.690	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
MD33: <i>MD Space Exp Center (MDSEC)</i>	4.088	20.031	19.755	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	0.956	1.009	0.935	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond was transferred to PE 1206893C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

A. Mission Description and Budget Item Justification

This program element primarily funds the Spacebased Kill Assessment (SKA) project, a Missile Defense Agency (MDA) experiment to demonstrate kill assessment from space. MDA experience with intercept testing on the Aegis BMD program provided solid understanding of the physics of kill assessment.

Several events set the stage for the kill assessment experiment that later became known as SKA:

- Section 237 in the FY 2014 National Defense Authorization Act directed MDA to improve kill assessment for the GMD program with an initial kill assessment capability by December 31, 2019
- An MDA study called the Space Layer Option Study found that disaggregated systems could provide sensor capabilities at lower costs
- A once in a decade opportunity became available when the commercial sector offered hosted payload services at costs far below what MDA could expect if it used traditional DOD space acquisition models

One feature of the SKA acquisition plays a crucial role in the execution of the experiment: schedule discipline. Since MDA cannot impact the schedule of the commercial host, maintaining schedule pace is priority #1 on the program. If SKA payloads are delivered late to the commercial host, they miss their opportunity to be launched into space.

SKA incorporates Government Accountability Office (GAO) recommendations to examine the operational feasibility of disaggregating large satellites (report number GAO-15-7) and to provide data for the business case for shared or dedicated satellite control, including the ground antenna networks (report number GAO-13-315). The SKA experiment will utilize a network of small IR sensors integrated onto commercial host satellites which, while on orbit, will observe missile defense intercepts and deliver a kill assessment declaration to the BMDS. SKA has the opportunity to change the economics of the defense of the American homeland from enemy ballistic missiles.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>
---	--

This program element also funds engineering trade studies and concept evaluations for current and future space based sensors.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	21.507	20.690	15.670	-	15.670
Current President's Budget	21.040	20.690	0.000	-	0.000
Total Adjustments	-0.467	0.000	-15.670	-	-15.670
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.467	0.000			
• Other Adjustment	0.000	0.000	-15.670	-	-15.670

Change Summary Explanation

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond was transferred to PE 1206895C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017			
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>					Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost	
MD33: <i>MD Space Exp Center (MDSEC)</i>	4.088	20.031	19.755	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603895C is transferred to PE 1206895C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

A. Mission Description and Budget Item Justification

The SKA system is composed of two segments: a space segment and a ground segment.

- The space segment is composed of a network of small infrared (IR) sensors (sensors, processor cards and cabling), each mated to a different satellite. The total number of sensors and where they are placed in the network are specifically tailored for the kill assessment mission. The space segment includes key design features to improve its resiliency.

- The ground segment is a small network of desktop computers, servers and routers that monitor the health of the on-orbit sensors, command the sensors to perform the kill assessment mission and analyze the data to make a kill assessment determination for the BMDS. The ground segment also includes the equipment necessary for communications security and information assurance. The Missile Defense Space Center (MDSC) is the communications hub for SKA data, routing SKA data between the commercial payload integrator and the SKA Payload Analysis Center.

The SKA sensors are hosted on satellites that are not developed by MDA, thus schedule performance is the highest priority of the experiment. Since the launch of the host satellites will not wait for hosted payloads that are delivered late, the management of the SKA project focuses on the ability to meet schedule commitments. In the past year, the commercial satellite host and the launch site owner have made small changes to the launch schedule; however, those changes have not affected SKA delivery commitments to the satellite integrator - the SKA project remains on schedule.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Spacebased Kill Assessment	20.031	19.755	0.000
Articles:	-	-	-
Description: The SKA project is an experimental system designed to demonstrate kill assessment for Homeland Defense. It includes SKA sensor-host satellite integration and testing, launch preparations, on-orbit checkout, experimental operations, and supports engineering trade studies and concept evaluations for current and future space based sensors. Specific accomplishments by year follow.			
FY 2016 Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Conducted Ground System Mission Simulation #2 (of 4) in November 2015 - Delivered first group of flight unit sensors to integrator in November 2015 - Completed sensor assembly and testing of SKA flight units - Completed delivery of flight unit sensors to integrator - Completed integration and testing of SKA payload with host payload module - Prepared for on-orbit checkout of first SKA sensors <p>FY 2017 Plans: Starting in FY 2017 funds begin to decrease for SKA as the project transitions from development to experimentation</p> <ul style="list-style-type: none"> - Conduct the integration and test of hosted payload modules onto host satellites - Complete preparations for on-orbit checkout of SKA sensors - Conduct on-orbit deployment, checkout, calibration and commissioning of the sensor network once on orbit - Test the integration and flow of data among the SKA sensors, the host communications network and the elements of the BMDS - Begin on-orbit operations by experimenting and participating in BMDS flight tests <p>FY 2018 Plans: In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603895C is transferred to PE 1206895C.</p>			
Accomplishments/Planned Programs Subtotals	20.031	19.755	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603893C: <i>Space Tracking and Surveillance System</i>	27.262	32.129	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
<i>Control, Battle Management & Communication</i>											
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

Remarks

D. Acquisition Strategy

SKA leverages experience that the Johns Hopkins University Applied Physics Laboratory (JHU/APL) has with its extensive history of performing kill assessment activities and conducting experiments associated with the Aegis BMD program. JHU/APL is the developer of the SKA experiment and its primary subcontractor will be responsible for payload integration and hosting accommodation using a firm fixed price contract to contain costs. The SKA experiment uses a commercial satellite program as the platform host for a DOD payload, taking full advantage of a multi-billion dollar space and ground system that already exists. Since MDA and JHU/APL cannot impact the launch schedule of the commercial satellite host, fiscal stability and commitment is required which is a small tradeoff for the significant cost savings that commercial hosting provides.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency											Date: May 2017				
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>					Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>				

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Spacebased Kill Assessment - MDSC Support (JRDC Services Contract)	SS/CPAF	NGIS : Schriever AFB, CO	0.000	0.142	Sep 2016	0.091	Feb 2017	0.000		-		0.000	0	0.233	0.233
Spacebased Kill Assessment - SKA Development and Experimentation	C/CPFF	JHU/APL : Laurel, MD	2.001	18.947	Oct 2015	18.342	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			2.001	19.089		18.433		0.000		-		0.000	-	-	-

Remarks

All efforts listed above will continue in PE 1206895C, project MD33

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

Funding for the Spacebased Kill Assessment was initiated in PE 0604883C, budget project MD10 in FY2014.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Spacebased Kill Assessment - Contract Support Services (CSS)	C/Various	Various, MDA : CO/AL	0.122	0.189	Oct 2015	0.187	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Spacebased Kill Assessment - FFRDC	FFRDC	Various : CO/AL/MD/VA	0.895	0.472	Nov 2015	0.748	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Spacebased Kill Assessment - IT User Services	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	0.038	Oct 2015	0.043	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Spacebased Kill Assessment - MDA Civilian	Allot	MDA : VA	0.194	0.201	Oct 2015	0.207	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Spacebased Kill Assessment - Program Mission Support	C/Various	Various : CO/AL/MD/VA	0.876	0.042	Oct 2015	0.137	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			2.087	0.942		1.322		0.000		-		0.000	-	-	-

Remarks
 All efforts listed above will continue in PE 1206895C, project MD33

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

Funding for the Spacebased Kill Assessment was initiated in PE 0604883C, budget project MD10, in FY2014.

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
 N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
 N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency								Date: May 2017					
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>				Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>					
	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.088	20.031		19.755		0.000		-		0.000	-	-	-

Remarks
 Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SKA Program Status Review	▲																															
SKA Mission Simulation 2	▲																															
SKA Flight Unit Development	◆	◆	◆																													
SKA Flight Model Assembly and Testing	◆	◆	◆																													
SKA Integration and Test - 1Q2016-4Q2016	◆	◆	◆	◆																												
SKA Flight Model Assembly Deliveries to Host Integrator	◆	◆	◆	◆																												
SKA Algorithm Development	◆	◆	◆	◆																												
SKA Mission Simulation 3				▲																												
FTG-15 (GM, Intercept Flight Test)								△																								
SKA Mission Simulation 4								△																								
SKA Integration and Test with Satellite - 1Q2017-4Q2017								◇	◇	◇	◇																					
SKA Launch #1																				△												
FTT-18 (TH, Intercept Flight Test)												△																				
SKA On-Orbit Check-Out - 4Q2017																◇																
FTT-15 (TH, Intercept Flight Test)												△																				

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SKA Program Status Review	1	2016	1	2016
SKA Mission Simulation 2	1	2016	1	2016
SKA Flight Unit Development	1	2016	3	2016
SKA Flight Model Assembly and Testing	1	2016	3	2016
SKA Integration and Test - 1Q2016-4Q2016	1	2016	4	2016
SKA Flight Model Assembly Deliveries to Host Integrator	1	2016	4	2016
SKA Algorithm Development	1	2016	4	2016
SKA Mission Simulation 3	4	2016	4	2016
FTG-15 (GM, Intercept Flight Test)	3	2017	3	2017
SKA Mission Simulation 4	1	2017	1	2017
SKA Integration and Test with Satellite - 1Q2017-4Q2017	1	2017	4	2017
SKA Launch #1	4	2017	4	2017
FTT-18 (TH, Intercept Flight Test)	3	2017	3	2017
SKA On-Orbit Check-Out - 4Q2017	4	2017	4	2017
FTT-15 (TH, Intercept Flight Test)	3	2017	3	2017

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	0.956	1.009	0.935	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016, Program Wide Support (PWS) reflects a proportional change as a result of increases in Ballistic Missile Defense System Space Programs and in FY 2017, PWS reflects a proportional change as a result of decreases to the Ballistic Missile Defense System Space Programs. Beginning in FY 2018, PWS was proportionately reallocated as a result of the Ballistic Missile Defense System Space Programs 0603295C transfer to Ballistic Missile Defense System Space Programs 1206895C program element.

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts and Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	1.009	0.935	0.000
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
N/A			
Accomplishments/Planned Programs Subtotals	1.009	0.935	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance SRM (MIPR)	MIPR	Various : Multi: AL, CO, CA, VA, AK	0.343	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	0.522	0.000		0.019	Jul 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	0.091	1.009	Nov 2015	0.916	Aug 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.956	1.009		0.935		0.000		-		0.000	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.956	1.009	0.935	0.000	-	0.000	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017													
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>											
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆															
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇															
					FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		
MD40 Program-Wide Support					◇	◇	◇	◇	◇	◇	◇	◇							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2017

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1,786.627	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>	1,282.742	255.003	266.312	251.033	-	251.033	268.130	293.051	285.343	296.433	Continuing	Continuing
MC01: <i>Cyber Operations</i>	1.474	4.256	0.905	5.305	-	5.305	11.021	15.706	15.684	19.530	Continuing	Continuing
MT01: <i>C2BMC Test</i>	128.186	55.799	52.727	51.555	-	51.555	46.828	51.109	47.340	47.255	Continuing	Continuing
MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>	300.964	96.140	116.552	103.440	-	103.440	114.132	120.070	125.220	127.736	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	73.261	14.798	19.771	18.782	-	18.782	21.164	22.020	22.824	23.185	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense Command and Control, Battle Management and Communications (C2BMC) Program provides hardware and develops software to link separate sensors and weapons into an integrated, layered missile defense system that provides greater performance and defensive coverage than is possible with stand-alone elements. This program element investigates concepts and performs systems engineering to address hypersonic threats. The C2BMC enables the Ballistic Missile Defense System (BMDS) to manage complex threats, including near-simultaneous enemy missiles aimed at theater, regional, or homeland assets. Systems linked through C2BMC include Patriot, Terminal High Altitude Area Defense (THAAD), Aegis Ballistic Missile Defense (BMD), Aegis Ashore, Ground Based Midcourse Defense (GMD), and Army Integrated Air and Missile Defense Battle Command System (IBCS), and sensors such as the Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) Radar, Sea-Based X-Band Radar (SBX), Space-Based Infrared System (SBIRS), and BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA). C2BMC provides the warfighter the capability to plan the BMD fight while concurrently tracking all potential ballistic missile threats, and pairing any sensor with any weapon system to defeat ballistic missile threats at any range, in all theaters. The C2BMC program also works to increase coalition partners' capabilities. This effort also investigates concepts and explores system engineering issues associated with innovative space applications for a missile defense intercept and defeat system.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>
---	---

FY 2017 Amended Budget Request Justification: \$+16.650M is required to address Joint Emergent Operational Need requirements to ensure readiness of the BMDS. \$+16.650M Project MD01-C2BMC/C2BMC Development and Deployment to begin OSD Joint Rapid Acquisition Cell (JRAC)-directed efforts to develop and field a limited capability to provide missile warning and tracking of hypersonic weapons.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	429.853	439.617	413.198	-	413.198
Current President's Budget	425.996	456.267	430.115	-	430.115
Total Adjustments	-3.857	16.650	16.917	-	16.917
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.094	0.000			
• SBIR/STTR Transfer	-5.951	0.000			
• Other Adjustment	0.000	16.650	16.917	-	16.917

Change Summary Explanation

Increase in FY 2018 from PB 2017 to PB 2018 provides development and deployment of the Post Intercept Assessment (PIA) capability, Discrimination Improvements and Countermeasures Mitigation, Command & Control risk reduction efforts for NORTHCOM C2BMC mission suite, and increased C2BMC Cybersecurity measures. Also includes implementation of reduced contract spending for Mission Support Services in accordance with Department Service Requirement Review Board reductions through increased competition

FY 2017 Amended Budget Request Justification: \$+16.650M is required to address Joint Emergent Operational Need requirements to ensure readiness of the BMDS.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017			
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost	
MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>	1,282.742	255.003	266.312	251.033	-	251.033	268.130	293.051	285.343	296.433	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

Note

N/A

A. Mission Description and Budget Item Justification

This project funds the development, deployment and operational support of C2BMC capabilities required for Ballistic Missile Defense System (BMDS) planning, situational awareness, sensor management, and engagement coordination. C2BMC capabilities are traceable to baselined BMDS specifications and associated Element specifications to ensure the BMDS functions as an integrated system. C2BMC development activities culminate in three key events: simulation-based verification focused on integration testing with other BMDS elements; Site Activation Testing; and BMDS Ground Testing verifying delivery of functioning operational software packages for designated spiral deliveries to the warfighter.

Designated Capability Deliveries include:

The Robust Medium-Range Ballistic Missile (MRBM) Defense / Improved Discrimination European Phased Adaptive Approach (EPAA) Phase 1 and 2 (Spiral 6.4) is currently deployed, providing improved battle management capabilities and Planner updates. C2BMC continues to develop/update MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) capabilities to address joint emergent warfighter operational requirements.

Enhanced Homeland Defense (Spiral 8.2-1) has completed development and is currently undergoing verification testing prior to FY 2018 fielding. This spiral provides the following critical Homeland Defense capabilities: increased Ground-based Midcourse Defense (GMD) battlespace, improved threat tracking using multiple sensors communicating via Link 16, enhanced sensor tasking to meet track quality and discrimination timeliness requirements, space situational awareness tasking support, and improved cyber capabilities. Enhanced Homeland Defense (Spiral 8.2-1) integrates the BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA) with the BMDS to enhance BMDS missile-tracking capabilities through earlier cueing of radars and weapon systems.

Fulfilling Presidential mandate, EPAA Phase 3/Engage-on-Remote (EOR) (Spiral 8.2-3) is in development and will provide EPAA Phase 3/ EOR capability in FY 2019. EPAA Phase 3/EOR (Spiral 8.2-3) will deliver critical sensor management capability, greater engagement flexibility, and a five-fold improvement in Aegis BMD defended area by enabling Aegis to use Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) data for EOR engagements. EPAA Phase 3/EOR (Spiral 8.2-3) will also improve OPIR-based cueing.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
<p>C2BMC is in preliminary design review for Long Range Discrimination Radar (LRDR) Control for Homeland Defense (Spiral 8.2-5). LRDR for Homeland Defense (Spiral 8.2-5) is scheduled for delivery in CY 2020 to support the fielding of LRDR into the BMDS. This spiral will increase homeland and regional defense capabilities by leveraging C2BMC's ability to perform sensor management and synthesize LRDR sensor data into the BMD System tracking capability and providing LRDR-based information to GMD Fire Control (GFC) and other BMDS elements. LRDR for Homeland Defense (Spiral 8.2-5) will integrate the BMDS with the new Army Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS).</p> <p>Related disciplines provide development and deployment support to C2BMC system capabilities, including the following: C2BMC International Partner system engineering is vital to ensure friends and allies are integrated to the fullest extent possible with U.S. BMDS capabilities. Collaborative system engineering, testing and fielding facilitate interoperability with North Atlantic Treaty Organization (NATO) and partner nations such as Israel and Japan. C2BMC works with these nations to define and document international interfaces that are compatible with international standards and traceable to U.S. BMDS requirements. C2BMC participates in test events and live fire exercises hosted by international partners to ensure U.S. missile defense weapons, sensors and C2 systems are interoperable with international systems. C2BMC maintains and upgrades the U.S./NATO secure data sharing gateways located at Ramstein Air Base, Germany, for missile defense operations and training. C2BMC also supports development of Japan's BMD requirements to ensure interoperability of Japanese and U.S. BMD systems (sensors, shooters, command and control (C2)) resulting in an integrated regional, operational, and strategic defense of Japan.</p> <p>C2BMC Modeling and Simulation (M&S) maintains BMDS simulation/stimulation tools and federated models to support development and verification of deployed C2BMC Spirals. The BMDS C2BMC Model (BCM) is used for Flight Test pre-mission analysis and exercises to represent a second C2 Suite for Cross-Area of Responsibility (XAOR) functionality, and supports development and integration of GMD, AN/TPY-2, and Aegis software and models. The BCM program provides a cost effective means to assess and explore the performance space of the BMDS beyond what can be physically tested.</p> <p>The C2BMC Program Element also develops the following evolutionary capabilities: C2BMC leverages BOA enhancements to enable the BMDS to keep pace with emerging threats. C2BMC develops, integrates, and tests advanced algorithms to improve discrimination capabilities and enhance the use of space-based sensor data. BOA fuses worldwide coverage of multiple SBIRS and Intelligence Community sensor data into precision three-dimensional missile tracks which C2BMC uses for radar and fire control cueing. BMDS Overhead Persistent Infra-Red Architecture software version 5.1 will provide initial boost phase tracking when delivered to the warfighter with C2BMC Enhanced Homeland Defense (Spiral 8.2-1) in FY 2018. BMDS Overhead Persistent Infra-Red Architecture software version 6.1 will extend discrimination target tracking by adding wideband sensors when delivered with EPAA Phase 3/EOR (Spiral 8.2-3) in FY 2019.</p> <p>Post Intercept Assessment (PIA) is a BMDS capability that improves engagement effectiveness by synthesizing BMDS sensor multi-phenomenology tracking and discrimination data, communicating specific cueing and tasking messages, and implementing data analysis and decision logic tasks. Through a time-phased approach, each BMDS Element incrementally develops their contributions to the PIA solution. C2BMC's primary contributions to PIA include sensor and weapon system interfaces, sensor cueing/tasking, improved track processing, development and integration of multi-phenomenology physics-based prediction models, and the assessment decision logic and integrated display for the BMDS.</p>		

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
--	---	--

MDA will leverage existing sensors and ground infrastructure/C2 to quickly demonstrate and deploy a detection and warning capability in support of Hypersonic Defense.

MDA's discrimination improvements effort will develop and field integrated Element capabilities to improve BMD System ability to identify lethal and non-lethal objects. In conjunction with the discrimination improvements effort, C2BMC will continue to work to integrate LRDR into the BMDS.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Title: C2BMC Development and Deployment</p> <p align="right">Articles:</p> <p>Description: Provides funding for development and deployment of C2BMC capability Spirals that will link sensors and shooters to enable integrated BMDS capabilities, integrate BOA with the BMDS architecture to enhance missile tracking capabilities and enable much earlier cueing of radars and shooters, and fulfill Cybersecurity requirements. Recurring accomplishments include the following:</p> <ul style="list-style-type: none"> - Development and procurement of hardware, software, and network capability - Critical design reviews - Participation in test readiness reviews, pre-test engineering and analysis of the results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP) - Site planning, scheduling and hardware acquisition to support planned deployment of the C2BMC Spiral capabilities. - Update of BCM verification scenarios for all C2BMC Spirals deployed and under development. <p>Specific and/or unique accomplishments for each fiscal year (FY) are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Completed development and fielding of MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) maintenance release to support warfighter improvements and required security updates correcting vulnerabilities. - Conducted successful BMDS Overhead Persistent Infra-Red Architecture Phase 5.1 Ship Readiness Review in preparation for participating in the ground test GT-07a campaign in FY 2017. - Completed, tested, and fielded a new near-term discrimination capability to USNORTHCOM, STRATCOM, and USPACOM enabling MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) to direct discrimination tasking for strategic threats. This upgrade will increase BMDS capability when leveraged with the corresponding AN/TPY-2 software upgrade planned for FY 2017. - Conducted data collection and analysis for final assessment of discrimination technology candidates planned for Mid-term discrimination improvements. - Completed system maturation and performance characterization of the Simultaneous Correlation of Unambiguous Tracks (SCOUT) through the GMD Controlled Test Vehicle 02+ (CTV-02+) flight test and simulation data analysis activities; successfully 	212.196	217.634	197.853
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>demonstrated unique methodology to automate track processing, correlation, and extraction of data critical for discrimination declarations in a variety of complex and data-sparse scenarios.</p> <ul style="list-style-type: none"> - Provisioned Military Satellite Communications (MILSATCOM) and redundant terrestrial communication services from C2BMC to the LRDR. - Conducted successful BMDS Overhead Persistent Infra-Red Architecture Phase 6.1 Critical Design Review and began operational software development. - Modified Enhanced Homeland Defense (Spiral 8.2-1) Two-Factor Authentication (Smart-card) capability on a classified weapon system, remote administration of the systems, remote scanning, monitoring and event response, and automate anti-virus and patch management. - Initiated EPAA Phase 3/EOR (Spiral 8.2-3), baselined in January 2015, engineering and design for the development of capabilities addressing EPAA Phase 3 requirements for EOR integration of BMDS Overhead Persistent Infra-Red Architecture Phase 6.1 wideband extended tracking, integration of the Army IBCS program, and two Warfighter Improvement Process upgrades. Capability improvements will include modifications to C2BMC track processing, Link-16 track reporting, sensor resource management, and mission planning. <p>FY 2017 Plans:</p> <p>The net increase from FY 2016 to FY 2017 is attributed to additional funding for Far Term Discrimination improvements and Hypersonic Defense initial detection and warning capability offset in part by the funding decrease to realign funds from the Development project (MD01) to the Development Support project (MX01) to better align scope for all Integrated Logistics Support (ILS) to the Parallel Staging Network (PSN) Sustainment and the completed development and fielding of MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) software maintenance release.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Complete verification and deployment of capabilities in support of the Enhanced Homeland Defense spiral. - Complete validation testing at NORTHCOM and PACOM sites to enter system level ground testing for capability declaration - Complete assessment for Near-Term discrimination improvements capability readiness for fielding - Complete Mid-Term discrimination improvements systems engineering work and integrate element level design solutions - Complete SCOUT discrimination capability initial design and begin final design and development - Complete federated model development and begin BCM development for C2BMC EPAA Phase 3/EOR (Spiral 8.2-3) development and verification - Complete procurement and delivery of hardware for all sites to support deployment of the Enhanced Homeland Defense spiral. -- Initiate fielding of EUCOM and CENTCOM hardware to support EPAA Phase 3 -- Integrate and test improved OPIR-based cueing of radars and shooters to add the ability to track threats in all phases of flight 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>-- Integrate red/blue force updates into planner to stay current with the latest threat and BMDS element updates</p> <p>-- Initiate LRDR for Homeland Defense (Spiral 8.2-5) design and development activities; technology baseline planned for CY 2016</p> <p>-- Leverage existing ground infrastructure to design/develop/deploy a detection and warning capability in support of Hypersonic Defense.</p> <p>FY 2018 Plans:</p> <p>The net decrease from FY 2017 to FY 2018 is attributed to the completed development, testing and fielding of BMDS Enhanced Homeland Defense (Spiral 8.2-1) offset in part by an increase for Discrimination Improvements and Countermeasures Mitigation, LRDR Command & Control risk reduction efforts for NORTHCOM C2BMC mission suite, and BMDS Post Intercept Assessment development.</p> <p>- Conduct activities listed in Description section (above).</p> <p>- MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4):</p> <p>-- Maintain capability to develop/deploy emergent operational requirements.</p> <p>- BMDS Enhanced Homeland Defense (Spiral 8.2-1):</p> <p>-- Integrate red/blue force updates into the Planner to stay current with the latest threat and BMDS element updates.</p> <p>- EPAA Phase 3 / EOR (Spiral 8.2-3):</p> <p>-- Complete development; initiate fielding of hardware and capability to EUCOM, CENTCOM, and PACOM and support operation.</p> <p>-- Integrate EOR capability support to Aegis 5.1.</p> <p>-- Complete BMDS Overhead Persistent Infra-Red Architecture Phase 6.1 software verification testing and Ship Readiness Review (SRR).</p> <p>-- Integrate and test improved OPIR-based cueing of radars and shooters to add the ability to track threats in all phases of flight.</p> <p>- LRDR for Homeland Defense (Spiral 8.2-5):</p> <p>-- Initiate/Conduct/complete Critical Design Review (CDR) for the following capabilities:</p> <p>--- LRDR task management</p> <p>--- Regional peer-to-peer engagement coordination.</p> <p>--- Interoperability with Sea-based X-band Radar (SBX) forward based discrimination data.</p> <p>--- 2020 Integrated Air and Missile Defense Battle Command System Engagement Operations Center (EOC) interoperability.</p> <p>--- Continue prototyping OPIR enhancements to address new threats.</p> <p>--- Integrate C2BMC capabilities with Army's IAMD Battle Command System.</p> <p>- Discrimination Improvements:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>-- Mature and integrate Integrated Threat Characterization solutions that refine system track purity, accuracy and covariance consistency to support the construction and transmission of correlated systems tracks and aid the formulation of a discrimination result to attach to the system track messages.</p> <p>- PIA: -- Initiate PIA Phase 1 and 2 development/integration actions leveraging prototypes developed in X-Lab, to establish an operational PIA capability to mature products yielding a fielded capability that enables shoot-assess-shoot shot doctrine in BMDS Increment 7.</p> <p>- M&S: -- Maintain BMDS simulation/stimulation tool and federated model, and BCM to support Enhanced Homeland Defense (Spiral 8.2-1) Operation. Complete federated model development and BCM development for EPAA Phase 3/EOR (Spiral 8.2-3) development and verification. Initiate BCM development for LRDR for Homeland Defense (Spiral 8.2-5) and provide OPIR modeling simulation for ground tests.</p> <p>- International Partner System Engineering: -- Document international interfaces and traceability to BMDS requirements with all international mission partners, provide EPAA Phase 3 situational awareness display sustainment in accordance with bi-lateral agreements, ensure NATO technical approach is consistent with US systems as NATO modifies their C2 to meet their expanding BMD mission, and provide support for Japan BMD requirements.</p>			
<p>Title: C2BMC Communications</p> <p align="right">Articles:</p> <p>Description: The BMD Communications Network (BCN) ties together an expanding set of sensors and weapons systems to enable the National Command Authority and the commanders at the strategic, theater and tactical levels to optimally engage ballistic missile threats including near simultaneous theater, regional and homeland attacks. Recurring accomplishments include the following:</p> <ul style="list-style-type: none"> - Provide GMD Communications Network (GCN) Long Haul Communications Transport (LHCT)) services and a robust, end-to-end, high availability, operational communications network (COMNET) infrastructure with diverse paths that quickly and unambiguously share information across the global BMDS. - Participate in and analyze results from events scheduled in the BMDS IMTP - Provide engineering and deployment support of C2BMC Deployable Interface Nodes - Provide BMDS communications via leased DISA circuits, and resolves real-time operational issues through DISA's Network Operations and Security Center 	23.957 -	28.102 -	30.872 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>- Provide effective network management to coordinate and integrate information across diverse equipment platforms, interface with other DoD communications systems, evolve information standards and capabilities, and adhere to the DoD Risk Management Framework (RMF).</p> <p>- Upgrade BCN capability by supporting all EPAA phases and DoD teleports to enhance satellite communications.</p> <p>Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Provided engineering support to AN/GSC-52B SATCOM terminal, Modernization Enterprise Terminal (MET), at Ramstein Air Base for connectivity via Indian Ocean Defense Satellite Communication System (DSCS) - Provided network, communications and risk management support for MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) in EUCOM, STRATCOM, NORTHCOM, PACOM, and CENTCOM - Provided support of AN/TPY-2 radar communications nodes to ensure continued performance and operations including installation of new AN/TPY-2 radar communications node at a site in Japan and installation and support of AN/GSC-52B SATCOM terminals, Modernization of Enterprise Terminal-Transportable (MET-T), at a site in Japan - Fielded Protected Anti-Jam (AJ) / Anti-Scintillation (AS) Wideband Network System (PAAWNS) to missile defense locations worldwide - Upgraded the BMD Communications Network capability (development, integration and test) to support EPAA - Upgraded DoD teleports to enhance SATCOM connectivity - Provided Cyber Net Defense (CND) requirements for Homeland Defense EPAA Phase 2. <p>FY 2017 Plans:</p> <p>The FY 2016 to FY 2017 increase is attributed to fielding of modems for the PAAWNS providing anti-jam capability for SATCOM in a nuclear environment and the completion of Phase 3 EPAA (Poland) deployment.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Acquire network circuits to support planned Enhanced Homeland Defense (Spiral 8.2-1) capability deployment. - Continue engineering support to AN/GSC-52B SATCOM terminal, Modernization Enterprise Terminal (MET), at Ramstein Air Base via the Indian Ocean DSCS. - provide Cyber Net Defense (CND) requirements for Homeland Defense EPAA Phase 3. <p>FY 2018 Plans:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>The FY 2017 to FY 2018 increase is attributed to the hardening of communication that will provide anti-jam and anti-scintillation capability.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Provide Ground-Based Midcourse Defense support to SBX communications upgrade to replace end of life / end of sale SATCOM equipment and services. - Acquire additional network circuits to support planned EPAA Phase 3/EOR (Spiral 8.2-3) capability deployment. - Initiate planning for modem tech refresh and the next generation waveform integration. 			
<p>Title: Enterprise Sensors Lab (ESL)</p> <p align="right">Articles:</p> <p>Description: ESL performs early integration of new capabilities for future C2BMC BOA development and soaks these capabilities against real-world Targets of Opportunity (TOOs) and MDA flight and ground tests to increase the technical maturity of critical algorithms and reduce risk. To improve the real-time utilization of all available OPIR and other Intelligence Community (IC) data, ESL and supporting activities prototype and demonstrate algorithms that fuse space, airborne, and terrestrial-based sensor data into three-dimensional (3-D) tracks in the boost and early mid-course phases of threat missile flyout, enabling sensor cueing and Launch/Engage-on-Remote (LOR/EOR) intercepts. Additionally, in support of Homeland Defense, ESL extracts features in support of PIA with a goal of enabling a shoot-look-shoot capability and discrimination assessment feedback. Recurring accomplishments include providing prototype development and predicted performance characterization for emerging MDA capabilities. Specific and/or unique accomplishments to a FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Incorporated initial SBIRS Geosynchronous Earth Orbit (GEO) Scanner Wideband capability to improve 3D track accuracy. - Initiated integration of SBIRS GEO Starer Wideband sensor data and OPIR to form a more accurate 3-D tracking capability. - Initiated a study to examine infrared/radio frequency (IR/RF) fusion development to yield improved discrimination analysis. - Integrated new Discriminating Sensors Technology (DST) airborne sensor data and generated real-time 3-D tracks to support simulated Aegis BMD LOR capability as part of MDA's Advanced Technology development activity. - Enhanced prototype algorithms to extract dimmer targets from sensor data to extend the length of the track and enable additional sensor cueing opportunities. <p>FY 2017 Plans:</p>	13.799	16.306	15.645
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>The increase in funding from FY 2016 to FY 2017 is attributed to the decision to change the functional allocation of interface requirements from C2BMC X-Lab to ESL and to accommodate increased TOO and flight test analysis for OPIR wideband data exploitation and aggregated discrimination capability experimentation.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Mature OPIR Enterprise tasking and cueing capability to support full spectrum of missile kill chain. - Support Director, Operational Test and Evaluation (DOT&E) directed Quick Reaction Test to develop and validate tactics, techniques, and procedures for OPIR-based precision cueing & tracking. - Initiate algorithm development to exploit new DST sensor data and cueing required to maintain target custody. - Accelerate BOA development and fielding effort to operationalize prototype missile warning and tracking capability in support of CJCS directed Joint Requirements Oversight Council Memorandum (JROCM). <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Expand connectivity to Intelligence Community (IC) and similar architectures and mature IC sensor data processing yielding mutually beneficial real-time data sharing and more robust fused data products. - Initiate Exceedance Generation Processing (EGP) from SBIRS measurement level wideband data to improve tracking accuracy and custody for challenging threats. - Initiate physics-based algorithm improvements for missile typing which are necessary to address emerging treats. - Initiate prototype development and predicted performance characterization for Discriminating Sensors Technology and Space-based Kill Assessment (SKA). 			
<p>Title: C2BMC Experimentation Lab (X-Lab)</p> <p align="right">Articles:</p> <p>Description: The C2BMC X-Lab explores, prototypes, and demonstrates future C2BMC technologies within C2BMC and as an integrated component with other BMDS elements. X-Lab evaluates proposed interfaces and data distribution architectures with the Joint Overhead persistent Infra-Red (OPIR) Ground (JOG), SBIRS to improve cueing efficiency and increase battlespace for Homeland Defense. The lab hosts fielded, in-development and prototype spiral development capabilities and enables flight and ground test participation for C2BMC, ESL, and OPIR products with robust connectivity to simulation frameworks, weapon systems, sensors, and operational assets. X-Lab performs early risk reduction activities resulting in on time, within budget deliveries to the C2BMC program contributing to a more effective BMDS.</p>	5.051 -	4.270 -	6.663 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Recurring accomplishments include collection and analysis of metrics that demonstrate C2BMC performance utilizing representative Suite hardware and software, assessing prospective technologies' impact on the BMDS and characterizing C2BMC Spiral performance in advance of formal deliveries.</p> <p>Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Evaluated the efficacy of virtualization when applied to the C2BMC mission node and determined that the approach provides increased flexibility to the war fighter and extends C2BMC usage for more users without significant investments in additional hardware. - Developed advanced Link-16 EOR prototype providing options for near-term initial EOR operations with the Aegis BMD weapon system. - Assessed alternative approaches for coordinating strategic sensor task planning, execution, and coordination with missile defense regional CCMD (NORTHCOM/PACOM) tasking priorities and identified an option that met requirements and avoided software/schedule changes to the Enhanced Homeland Defense development cycle. <p>FY 2017 Plans:</p> <p>The decrease in funding from FY 2016 to FY 2017 is attributed to the decision to change the functional allocation of OPIR source track interface requirements from X-Lab to the ESL.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Characterize the performance of engineering releases of Enhanced Homeland Defense and LRDR Control for Homeland Defense to mitigate risks early in the development and integration processes. - Assess alternative approaches for coordinating strategic sensor task planning, execution and coordination with missile defense regional CCMD (EUCOM/CENTCOM) tasking priorities. <p>FY 2018 Plans:</p> <p>The increase in funding from FY 2017 to FY 2018 is attributed to the funding increase for BMDS Post Intercept Assessment development.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Initiate Post Intercept Assessment prototyping activities. -- Assess Link 16 engagement coordination capabilities for planning and managing the execution of Link 16 remote engagements. This effort will include EOR evaluation in a series of flight and ground tests. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-- Evaluate interface requirements and message sets for prototype non-OPIR advanced sensors.			
Accomplishments/Planned Programs Subtotals	255.003	266.312	251.033

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	197.617	209.072	230.162	-	230.162	194.328	253.778	264.377	267.254	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603893C: <i>Space Tracking and Surveillance System</i>	27.262	32.129	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	21.040	20.690	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems was the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of five years through 1st quarter FY 2017. Spiral 8.2 will be fielded in three separate increments. Enhanced Homeland Defense (Spiral 8.2-1) will be fielded in FY 2018, fielding of EPAA Phase 3/EOR (Spiral 8.2-3) in FY 2019, and completion of system deployment with LRDR for Homeland Defense (Spiral 8.2-5) in FY 2021. This incremental fielding required a modification to the base contract increasing the ceiling by \$870 million and adding an additional five-year ordering period to extend the contract through first quarter FY 2022. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber ops support of the C2BMC system. They perform development and testing of C2BMC products in Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C2BMC Development and Deployment - Aggregated Discrim	Various	Various : Various	0.000	0.000		10.490	Oct 2016	7.765	Oct 2017	-		7.765	Continuing	Continuing	Continuing
C2BMC Development and Deployment - BOA Development	SS/CPAF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	6.573	6.221		10.315	Oct 2016	9.541	Oct 2017	-		9.541	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Hardware/Software Development, Integration & Test (I&T)	SS/CPIF	Lockheed Martin Team : Huntsville, AL/Colorado Springs, CO	430.125	118.395		116.863	Dec 2016	105.451	Dec 2017	-		105.451	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Integration	Various	Various : Various	160.198	0.000		0.000		0.000		-		0.000	0	160.198	0
C2BMC Development and Deployment - C2BMC Mid-Term Discrim-SCOUT	SS/CPFF	Northrop Grumman Space and Mission Systems : Huntsville, AL	9.751	19.377		4.900	Oct 2016	7.133	Aug 2018	-		7.133	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Mid-Term Discrim-SCOUT OGA	MIPR	Aviation and Missile Research Development and Engineering Center : Huntsville, AL	1.200	1.200		0.000		1.170	Dec 2017	-		1.170	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Contract Support Services	SS/FFP	Cobham Analytic Solutions, ECS, CACI, CSC : Arlington, VA/ Huntsville, AL	203.362	24.505		25.026	Oct 2016	0.000		-		0.000	0	252.893	0
C2BMC Development and Deployment - Contract Support Services (CSS)	C/CPFF	MiDAESS / TEAMS : Huntsville, AL; Colorado Springs, CO; NCR	0.000	0.000		0.000		22.966	Feb 2018	-		22.966	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency											Date: May 2017				
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>						

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C2BMC Development and Deployment - Federally Funded Research & Development Centers / University Affiliated Research Center	MIPR	MITRE, IDA, ORNL, Aerospace, JHU/APL, GTRI : Arlington, VA/ Huntsville, AL/ Colorado Springs, CO	125.319	14.891		21.405	Oct 2016	16.136	Oct 2017	-		16.136	Continuing	Continuing	Continuing
C2BMC Development and Deployment - IT User Services	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	4.898	Oct 2015	0.000		0.000		-		0.000	0	4.898	4.898
C2BMC Development and Deployment - MDA Civilian, Travel & PCS	Various	- : Huntsville, AL/ Colorado Springs, CO	105.335	22.709		21.635	Oct 2016	22.116	Oct 2017	-		22.116	Continuing	Continuing	Continuing
C2BMC Development and Deployment - OPIR Integration	SS/CPIF	Lockheed Martin : Huntsville, AL	0.000	0.000		1.000	Oct 2016	1.009	Oct 2017	-		1.009	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Post Intercept Assessment	C/CPAF	SciTec : Newark, NJ	0.000	0.000		0.000		3.300	Nov 2017	-		3.300	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Spiral Development	Various	Sandia, MDA Other : Various	0.000	0.000		6.000	Oct 2016	1.266	Oct 2017	-		1.266	Continuing	Continuing	Continuing
C2BMC Communications - Communication Equipment and Fielding	MIPR	DISA, PMDCATS, SPAWAR : Springfield, VA	107.226	13.192		12.884	Oct 2016	15.151	Jan 2018	-		15.151	Continuing	Continuing	Continuing
C2BMC Communications - BNOSC	SS/CPAF	Lockheed Martin Team / JRDC : Colorado Springs, CO	19.744	3.071		4.062	Oct 2016	4.566	Nov 2017	-		4.566	Continuing	Continuing	Continuing
C2BMC Communications - C2BMC Integration	Various	Services : DISA Agency	0.000	0.000		3.450	Oct 2016	3.665	Oct 2017	-		3.665	Continuing	Continuing	Continuing
C2BMC Communications - Communication Leases	MIPR	DISA : Arlington, VA	29.285	7.194		7.706	Oct 2016	7.490	Oct 2017	-		7.490	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C2BMC Communications - EUCOM Communications	MIPR	USAFE : Ramstein, DE	12.545	0.500		0.000		0.000		-		0.000	13.045	26.090	13.045
Enterprise Sensors Lab (ESL) - ESL	SS/CPAF	Sandia, Purdue, SciTech, DISA, Army, Navy, AMRDEC : Various	0.000	0.000		8.875	Oct 2016	8.161	Feb 2018	-		8.161	Continuing	Continuing	Continuing
Enterprise Sensors Lab (ESL) - Enterprise Sensor Lab	SS/CPAF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	30.651	13.799		7.431	Oct 2016	7.484	Oct 2017	-		7.484	Continuing	Continuing	Continuing
C2BMC Experimentation Lab (X-Lab) - X-Lab	SS/CPAF	Various / Lockheed Martin : Colorado Springs, CO	41.428	5.051		4.270	Oct 2016	6.663	Oct 2017	-		6.663	Continuing	Continuing	Continuing
Subtotal			1,282.742	255.003		266.312		251.033		-		251.033	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
--	---	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,282.742	255.003	266.312	251.033	-	251.033	-	-	-

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
--	---	--

	Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆											
	Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇											
	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
MD01 Command & Control, Battle Management, Communications (C2BMC)	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Spiral 8.2-1 NORTHCOM/PACOM Capability Declaration											△																	
Spiral 8.2-1/Spiral 8.2-3 CENTCOM Capability Declaration													△															
Spiral 8.2-1/Spiral 8.2-3 EUCOM Capability Declaration													△															
Spiral 8.2-3 NORTHCOM/PACOM Capability Declaration														△														
Spiral 8.2-5 Homeland Defense Capability Declaration																							△					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD01 Command & Control, Battle Management, Communications (C2BMC)	1	2016	4	2022
Spiral 8.2-1 NORTHCOM/PACOM Capability Declaration	1	2018	1	2018
Spiral 8.2-1/Spiral 8.2-3 CENTCOM Capability Declaration	1	2019	1	2019
Spiral 8.2-1/Spiral 8.2-3 EUCOM Capability Declaration	1	2019	1	2019
Spiral 8.2-3 NORTHCOM/PACOM Capability Declaration	3	2019	3	2019
Spiral 8.2-5 Homeland Defense Capability Declaration	1	2021	1	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MC01 / <i>Cyber Operations</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC01: <i>Cyber Operations</i>	1.474	4.256	0.905	5.305	-	5.305	11.021	15.706	15.684	19.530	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Command and Control, Battle Management and Communications (C2BMC) Cyber Operations sustain the Missile Defense Agency (MDA) Risk Management Framework (RMF) and Security Controls Assessments (SCA)/Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information System Security Manager (PM/ISSM) Plans of Action and Milestones (POA&Ms) for MDA C2BMC mission systems. Activities in this Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network/System Certification and Accreditation (C&A)	4.256	0.905	5.305
Articles:	-	-	-
<p>Description: This activity maintains the Assessment and Authorization (A&A) and Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and plans of action and milestones (POA&Ms) on all MDA information systems. This activity prepares and submits C&A documentation and accreditation recommendations to the MDA Chief Information Officer (CIO) /Certification Authority and the DAA. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of the MDA mission, test, and administrative systems. Recurring accomplishments include the following:</p> <ul style="list-style-type: none"> - Monitor and track cybersecurity and mitigations detailed in Information Technology security POA&Ms. - Conduct cybersecurity design, engineering, and architecture planning for C2BMC information technology systems - Plan and test the cybersecurity controls for C2BMC systems - Conduct Security Controls Assessment (SCA) testing continuous monitoring of C2BMC mission systems and provide POA&Ms to mitigate cybersecurity vulnerabilities. <p>Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Planned and completed test for Information Assurance (IA) controls for BMDS C2BMC systems. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>- Conducted annual information assurance/cybersecurity reviews on the C2BMC enclaves to assess compliance in implementing and maintaining IA controls.</p> <p>FY 2017 Plans: The decrease in funding from FY 2016 to FY 2017 is attributed to initial purchase of software/hardware used to test the impact of Department of Defense Windows 10 baseline requirements in a development/lab environment without risk of C2BMC mission interruption. Initial lab results help produce a phased implementation strategy and a conclusion to move to a different operating system in the future.</p> <p>- Continue recurring accomplishments listed in Description section (above).</p> <p>FY 2018 Plans: The increase in funding from FY 2017 to FY 2018 is attributed to required upgrade of hardware and software to improve C2BMC network defense against cyber threats and enhance cybersecurity posture. The Department plans to implement Windows 10 Secure Host Baseline. Multiple Cybersecurity Studies are required that will ensure a more secure C2BMC system is procured and integrated into the BMDS as a part of future acquisition and development efforts. Completion of the studies will then flow to the application of security engineering principles to acquire, design, test, implement and field technical solutions throughout the systems architecture to ensure sufficient protections exist from a threat and risk based approach. Additionally, the increase will fund a NORTHCOM Mission Node to support the increased need for timely cybersecurity testing of vulnerability corrective actions, cybersecurity patching, and hardening on the C2BMC Program.</p> <p>- Conduct activities listed in Description section (above). - Initiate hardware/software upgrade to include Net Defense tool sets for real time cyber defense monitoring by the C2BMC Command Center that will support tier 3 defenders. - Acquire, design, test, implement and field technical solutions in compliance with DoD RMF.</p>			
Accomplishments/Planned Programs Subtotals	4.256	0.905	5.305

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems was the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of five years through 1st quarter FY 2017. Spiral 8.2 will be fielded in three separate increments. Enhanced Homeland Defense (Spiral 8.2-1) will be fielded in FY 2018, fielding of EPAA Phase 3/EOR (Spiral 8.2-3) in FY 2019, and completion of system deployment with LRDR for Homeland Defense (Spiral 8.2-5) in FY 2021. This incremental fielding required a modification to the base contract increasing the ceiling by \$870 million and adding an additional five-year ordering period to extend the contract through first quarter FY 2022. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber ops support of the C2BMC system. They perform development and testing of C2BMC products in Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network/System Certification and Accreditation (C&A) - Civ Cyber Labor	Various	MDA Other : Various	0.211	0.000		0.348		0.352		-		0.352	Continuing	Continuing	Continuing
Network/System Certification and Accreditation (C&A) - IA/ CND Network/System C&A	C/CPFF	Torch Technologies : Colorado Springs, CO / Huntsville, AL	1.263	4.256		0.557	Jul 2017	0.562	Jul 2018	-		0.562	Continuing	Continuing	Continuing
Network/System Certification and Accreditation (C&A) - Information Assurance	SS/CPAF	Lockheed Martin : Colorado Springs, CO / Huntsville, AL	0.000	0.000		0.000		4.391	Jan 2018	-		4.391	Continuing	Continuing	Continuing
Subtotal			1.474	4.256		0.905		5.305		-		5.305	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.474	4.256	0.905	5.305	-	5.305	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
MC01 Cyber Operations	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC01 Cyber Operations	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017			
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MT01 / <i>C2BMC Test</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost	
MT01: <i>C2BMC Test</i>	128.186	55.799	52.727	51.555	-	51.555	46.828	51.109	47.340	47.255	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

Note

N/A

A. Mission Description and Budget Item Justification

TESTING

Command and Control, Battle Management and Communications (C2BMC) supports system flight and ground testing, wargames, and exercises as detailed in the MDA Integrated Master Test Plan (IMTP) to ensure C2BMC capabilities delivered are consistent with the Prioritized Capabilities List and are interoperable with other Ballistic Missile Defense System (BMDS) components.

LAB INFRASTRUCTURE

C2BMC gains efficiencies and minimizes laboratory resource requirements (footprint, personnel, and hardware) by utilizing the C2BMC test bed infrastructure as the laboratory environment supporting System Test, Development, and Sustainment. For System Ground and Flight Test, the labs are used for pre-test analysis, test execution and post-test analysis. For Development, the labs are utilized for software verification and validation testing and system integration testing. For Sustainment, the labs are used to assist with root cause determination for issues discovered on the fielded system and validation of any required software patches.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Integrated Master Test Plan	55.799	52.727	51.555
Articles:	-	-	-
Description: This activity funds C2BMC participation in BMDS flight and ground testing, wargames and exercises, and resources in accordance with the BMDS IMTP. Recurring accomplishments include: Test Execution: - Assess BMDS interoperability, integration, and functionality in lab and distributed environments, leveraging a complex set of scenarios to test the limits of the C2BMC system. Participate in and analyze results of ground tests and flight tests in accordance with the BMDS IMTP. Support all phases of the MDA Ground Test Concept of Operations (CONOPS) and the MDA Flight Test CONOPS. Provide Flight Test Predictive Analysis support. Generate, test, and distribute federated model compatible scenarios for Ground Test and Flight Test Experimentation test support. Use BMDS C2BMC Model (BCM) to support exercise integration testing activities including test case and scenario checkout.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Enterprise Sensors Laboratory (ESL):</p> <ul style="list-style-type: none"> - Utilizing the ESL, plan, coordinate, and provide test operations to demonstrate prototype algorithms through flight tests, ground tests and real-world targets of opportunity. The development plans for algorithm improvements focus on track and measurement level sensor data fusion and feature extraction to improve 3-d track formation utilizing a variety of space, airborne, and terrestrial-based sensors. Results from the tests and experiments are provided back to the algorithms development activity to enable algorithm refinement. <p>Experimentation Lab (X-Lab):</p> <ul style="list-style-type: none"> - Utilizing the X-Lab, plan, coordinate, and provide test operations to demonstrate maturing C2BMC technologies and software builds within an integrated C2BMC environment through flight tests, ground tests and real-world targets of opportunity before incorporation into formal C2BMC spiral builds. The development plans for C2BMC improvements focus on the BMDS Post Intercept Assessment (PIA) capability, architecture improvements, and C2BMC algorithm improvements to mitigate development risk. Results from the tests and experiments are provided back to the C2BMC and X-Lab development activity. <p>Wargame and Exercises:</p> <ul style="list-style-type: none"> - Participate in wargames and exercises using current and future C2BMC architectures to support all requesting combatant commands, NATO partners, and Host Nations allowing warfighters to validate Ballistic Missile Defense (BMD) Techniques, Tactics, and Procedures (TTP) specific to all designated Areas of Operations (AOs) to include current and future C2BMC architectures. <p>Resources:</p> <ul style="list-style-type: none"> - Continue the development and upgrades in the C2BMC Testbed (CTB) to support flight & ground tests. Continue Cyber Testing in the CTB to support continuous C2BMC spiral development. Continue C2BMC and NATO planning demonstrations and support to NATO live fire events. Provide Situational Awareness (SA) Node sustainment for the BMDS increment development to support ongoing planning and cooperation in the development and enhancement of interoperability between U.S. BMD systems and the NATO BMD systems. Provide infrastructure, network, and troubleshooting support to C2BMC Command Center (CCC), to include the BMDS Network Operations and Security Center (BNOSC), System Test and Operations Center (STOC), C2BMC System Support Center (CSSC), BMDS Communications Network (BCN), Distributed Multi-Echelon Distributed Training system (DMETS) Infrastructure, and the Distributed Training system (DTS). <p>Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed the GTD-06 P2 campaign testing the C2BMC Spiral 6.4-3. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>- Participated in FTO-02 Events 1 and 2 to evaluate the C2BMC contribution to successful engagement of the target.</p> <p>- Participated in GM CTV-02+ to provide accurate and timely status of BMDS under test and situational awareness to CCMD displays.</p> <p>- Demonstrated IRBM engagement, and assessed C4ISR capability using space sensors for discrimination.</p> <p>- Initiated GT-07a Campaign to support the C2BMC S8.2-1 Test Capability Decision (TCD).</p> <p>- Initiated Planning of FTT-15/ FTT-18, and FTG-15.</p> <p>ESL:</p> <p>- Demonstrated prototype algorithm performance for track and measurement level sensor data fusion and feature extraction through six flight tests and over 300 real-world targets of opportunities and provided test and demonstration results back to the algorithms development activity to enable algorithm refinement.</p> <p>X-Lab:</p> <p>- Cooperatively executed multiple Hardware in the Loop and flight tests with ESL and Discrimination Sensor Technology (DST) to provide the C2BMC enterprise track reporting to support remote engagement simulations with Aegis BMD.</p> <p>- Conducted an experiment during GM CTV-02+.</p> <p>Resources:</p> <p>- Provided engineering, design, and installation of C2BMC Spiral 8.2-1; build-out of BMDS Overhead Persistent Infra-Red Architecture Phase 5.1; and EUCOM Region upgrades.</p> <p>FY 2017 Plans:</p> <p>The decrease in funding from FY 2016 to FY 2017 is attributed to an adjustment from the IMTP Flight Test Program as well as moving up Spiral 8.2 build-out of labs located at the Missile Defense Integration and Operations Center (MDIOC) to meet delivery schedule.</p> <p>Test Execution:</p> <p>- Through ground testing, assess the quality and completeness of message traffic between C2BMC Enhanced Homeland Defense (Spiral 8.2-1) and Army/Navy Transportable Radar Surveillance model 2 (AN/TPY-2) (FBM).</p> <p>- Demonstrate the contribution of C2BMC to completion of GBI engagement in a flight test event.</p> <p>- Demonstrate the capability of C2BMC to exchange data in accordance with BMDS specifications and System Interface Control Documents (SICDs), and demonstrate C2BMC Link 16 functionality to report system tracks to THAAD in a flight test event.</p> <p>- Assess the C4ISR capability using space sensors to discriminate target.</p> <p>- Initiate ground test planning to demonstrate C2BMC EPAA Phase 3/EOR (Spiral 8.2-3) ability to provide Aegis BL 9C.2 Engage on Remote (EOR) and improved BOA sensor processing, and to support EPAA Phase 3/EOR (Spiral 8.2-3) fielding decision.</p> <p>FY 2018 Plans:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Test Execution: - Integrate and test the BMDS OPIR Architecture to enable earlier cueing of sensor and shooter, improve threat tracking, and provide source information for discrimination processing. - Participate in GM, Intercept Flight Test to support the remaining Increment 4, BMDS Enhanced Homeland Defense Increment, and the fielding of Enhanced Homeland Defense (Spiral 8.2-1) in NORTHCOM/PACOM by testing the following capabilities: Engagement support tasking; BMD planning, SBIRS Increment 2 interface change and communications enhancements; AN/TPY-2 Forward-Based Mode (FBM) Space Situational Awareness (SSA); Unified Client for net-centric operations; new C2BMC infrastructure and architecture update. - Continue the execution of BMDS Ground Test, participate in OTA, Intercept Flight Test, and Cycle 2/Cycle 5 testing of C2BMC EPAA Phase 3/EOR (Spiral 8.2-3) suite to support Increment 5, European Phased Adapted Approach (EPAA) Phase 3 Situational Awareness (SA) Node sustainment and Robust IRBM Defense, fielding of C2BMC EPAA Phase 3/EOR (Spiral 8.2-3) in NORTHCOM/PACOM and EUCOM/CENTCOM. - Demonstrate Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) capability utilizing X-Lab and ESL to provide adequate track quality to cue a Launch on Remote (LoR) using sensor data, as well as the ability to support a Post Intercept Assessment using C4ISR labs/algorithms to cue sensors to collect/process data, in order to support future Increments. - Participate in a baseline of 4 flight test events to characterize performance and obtain experimental results that will be used to mature algorithms that fuse space, airborne, and terrestrial-based sensor data into 3D tracks in the boost and early mid-course phases of threat missile flyout. - Support EPAA Phase 3 Technical Capability Declaration.			
Accomplishments/Planned Programs Subtotals	55.799	52.727	51.555

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603893C: <i>Space Tracking and Surveillance System</i>	27.262	32.129	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	21.040	20.690	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

Remarks

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems was the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of five years through 1st quarter FY 2017. Spiral 8.2 will be fielded in three separate increments. Enhanced Homeland Defense (Spiral 8.2-1) will be fielded in FY 2018, fielding of EPAA Phase 3/EOR (Spiral 8.2-3) in FY 2019, and completion of system deployment with LRDR for Homeland Defense (Spiral 8.2-5) in FY 2021. This incremental fielding required a modification to the base contract increasing the ceiling by \$870 million and adding an additional five-year ordering period to extend the contract through first quarter FY 2022. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber ops support of the C2BMC system. They perform development and testing of C2BMC products in Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor`s team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Master Test Plan - BMDS Level Testing GOV	MIPR	Army/Air Force : Various	0.000	0.000		2.517	Oct 2016	2.002	Oct 2017	-		2.002	Continuing	Continuing	Continuing
Integrated Master Test Plan - Enterprise Sensors Lab Infrastructure	SS/CPAF	Northrop-Grumman Corporation : Colorado Springs, CO	6.535	6.168		22.275	Oct 2016	25.004	Oct 2017	-		25.004	Continuing	Continuing	Continuing
Integrated Master Test Plan - Enterprise Sensors Lab Infrastructure Support	MIPR	Various : VA; OH; AL; NM; CA	6.161	2.085		3.534	Oct 2016	2.517	Oct 2017	-		2.517	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master Test Plan BMDS Level Testing	SS/IDIQ	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO	51.718	21.404		23.614	Jul 2017	22.032	Jul 2018	-		22.032	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Master Test Plan - Integrated Master Test Plan BMDS level Testing (Element/System Test Lab Facilities)	SS/CPAF	Northrop-Grumman Corporation : Colorado Springs, CO	63.772	26.142		0.787	Oct 2016	0.000		-		0.000	0	90.701	0
Subtotal			128.186	55.799		52.727		51.555		-		51.555	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	128.186	55.799	52.727	51.555	-	51.555	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
GTI-ISR (16) (BMDS Ground Test)		◆												
GTD-06 Part 2 (BMDS Ground Test)		◆												
Warfighter TP 06 (BMDS Ground Test)			◇											
FTX-31 (DT Tracking Exercise Flight Test)			△											
FTT-18 (TH, Intercept Flight Test)				△										
FTT-15 (TH, Intercept Flight Test)				△										
FTG-15 (GM, Intercept Flight Test)				△										
SFTM-02 (AEGIS 5.1, Intercept Flight Test)				△										
FTX-32 (DT Tracking Exercise Flight Test)				△										
GTI-07a (BMDS Ground Test)				◇	◇									
FTP-13 (P8-0T4) (LTPO, Intercept Flight Test)					△									
GTD-07a (BMDS Ground Test)					◇									
FS 17-1 (DT Tracking Exercise Flight Test)					△									
FTM-29 (AEGIS 5.1, Intercept Flight Test)						△								
FE-1 (DT Tracking Exercise Flight Test)						△								
FS 17-2 (DT Tracking Exercise Flight Test)						△								
FS 17-4 (DT Tracking Exercise Flight Test)						△								
Warfighter TP 07a (BMDS Ground Test)							◇							
GTI-07b (E/C) (BMDS Ground Test)							◇	◇						
FT0-03 E1 (OTA, Intercept Flight Test)								△						
FTG-11 (IOT&E) (GM, Intercept Flight Test)									△					
GTD-07b (E/C) (BMDS Ground Test)									◇	◇				
FTM-31 (AEGIS SBT, Intercept Flight Test)										△				
GTI-07b (N/P) (BMDS Ground Test)											◇			

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022		
FT0-03 E2 (OTA, Intercept Flight Test)											△										
FTM-32 (AEGIS SBT, Intercept Flight Test)											△										
FTM-33 (AEGIS SBT, Intercept Flight Test)											△										
GTD-07b (N/P) (BMDS Ground Test)											◇	◇									
FTX-23 (AEGIS 5.1, Target Only Flight Test)											△										
FTX-27 (SN, Target Only Flight Test)											△										
GTI-08 (E/C) (BMDS Ground Test)											◇	◇									
Warfighter TP 07b (BMDS Ground Test)												◇									
GTI-08 (N/P)(BMDS Ground Test)													◇	◇							
FTT-19 (TH, Intercept Flight Test)														△							
FTM-24 (AEGIS 5.0, Intercept Flight Test)														△							
GTD-08 (E/C) (BMDS Ground Test)														◇	◇						
FTM-30 (AEGIS 5. 1, Intercept Flight Test)															△						
GTD-08 (N/P) (BMDS Ground Test)																◇					
GT-21 Sprint 1 (BMDS Ground Test)																◇					
FTG-17 (IOT&E) (GM, Intercept Flight Test)																△					
Warfighter TP 08 (BMDS Ground Test)																	◇				
GT-21 Sprint 2 (BMDS Ground Test)																	◇				
GT-21 Sprint 3 (BMDS Ground Test)																	◇	◇			
FTX-26 (SN, Target Only Flight Test)																			△		
FTM-38 (AEGIS 5.0, Intercept Flight Test)																			△		
GT-21 Sprint 4 (BMDS Ground Test)																			◇		
FTT-21 (TH, Intercept Flight Test)																				△	
GT-21 Sprint 5 (BMDS Ground Test)																				◇	

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

	Significant Event Complete ▲ Significant Event Planned △		Milestone Decision Complete ★ Milestone Decision Planned ☆		Element Test Complete ◆ Element Test Planned ◇		System Level Test Complete ● System Level Test Planned ○		Complete Activity ◆ Planned Activity ◇								
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022										
GT-21 Sprint 6 (BMDS Ground Test)										◇							
FTG-18 (GM, Intercept Flight Test)																	△
GT-22 Sprint 1 (BMDS Ground Test)																	◇
GT-22 Sprint 2 (BMDS Ground Test)																	◇
GT-22 Sprint 3 (BMDS Ground Test)																	◇
FTM-35 (AEGIS 5.1, Intercept Flight Test)																	△
FTM-37 (IOT&E) (AEGIS 5.1, Intercept Flight Test)																	△
GT-22 Sprint 4 (BMDS Ground Test)																	◇
GTD-22 (E/C) (BMDS Ground Test)																	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GTI-ISR (16) (BMDS Ground Test)	3	2016	3	2016
GTD-06 Part 2 (BMDS Ground Test)	4	2016	4	2016
Warfighter TP 06 (BMDS Ground Test)	2	2017	2	2017
FTX-31 (DT Tracking Exercise Flight Test)	2	2017	2	2017
FTT-18 (TH, Intercept Flight Test)	3	2017	3	2017
FTT-15 (TH, Intercept Flight Test)	3	2017	3	2017
FTG-15 (GM, Intercept Flight Test)	3	2017	3	2017
SFTM-02 (AEGIS 5.1, Intercept Flight Test)	3	2017	3	2017
FTX-32 (DT Tracking Exercise Flight Test)	3	2017	3	2017
GTI-07a (BMDS Ground Test)	3	2017	4	2017
FTP-13 (P8-0T4) (LTPO, Intercept Flight Test)	4	2017	4	2017
GTD-07a (BMDS Ground Test)	4	2017	4	2017
FS 17-1 (DT Tracking Exercise Flight Test)	4	2017	4	2017
FTM-29 (AEGIS 5.1, Intercept Flight Test)	1	2018	1	2018
FE-1 (DT Tracking Exercise Flight Test)	1	2018	1	2018
FS 17-2 (DT Tracking Exercise Flight Test)	1	2018	1	2018
FS 17-4 (DT Tracking Exercise Flight Test)	1	2018	1	2018
Warfighter TP 07a (BMDS Ground Test)	2	2018	2	2018
GTI-07b (E/C) (BMDS Ground Test)	2	2018	3	2018
FT0-03 E1 (OTA, Intercept Flight Test)	3	2018	3	2018
FTG-11 (IOT&E) (GM, Intercept Flight Test)	4	2018	4	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

Events	Start		End	
	Quarter	Year	Quarter	Year
GTD-07b (E/C) (BMDS Ground Test)	4	2018	1	2019
FTM-31 (AEGIS SBT, Intercept Flight Test)	1	2019	1	2019
GTI-07b (N/P) (BMDS Ground Test)	1	2019	1	2019
FT0-03 E2 (OTA, Intercept Flight Test)	2	2019	2	2019
FTM-32 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
FTM-33 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
GTD-07b (N/P) (BMDS Ground Test)	3	2019	4	2019
FTX-23 (AEGIS 5.1, Target Only Flight Test)	4	2019	4	2019
FTX-27 (SN, Target Only Flight Test)	4	2019	4	2019
GTI-08 (E/C) (BMDS Ground Test)	4	2019	1	2020
Warfighter TP 07b (BMDS Ground Test)	1	2020	1	2020
GTI-08 (N/P)(BMDS Ground Test)	2	2020	3	2020
FTT-19 (TH, Intercept Flight Test)	3	2020	3	2020
FTM-24 (AEGIS 5.0, Intercept Flight Test)	3	2020	3	2020
GTD-08 (E/C) (BMDS Ground Test)	3	2020	4	2020
FTM-30 (AEGIS 5. 1, Intercept Flight Test)	4	2020	4	2020
GTD-08 (N/P) (BMDS Ground Test)	1	2021	1	2021
GT-21 Sprint 1 (BMDS Ground Test)	1	2021	1	2021
FTG-17 (IOT&E) (GM, Intercept Flight Test)	1	2021	1	2021
Warfighter TP 08 (BMDS Ground Test)	2	2021	2	2021
GT-21 Sprint 2 (BMDS Ground Test)	2	2021	2	2021
GT-21 Sprint 3 (BMDS Ground Test)	2	2021	3	2021
FTX-26 (SN, Target Only Flight Test)	3	2021	3	2021
FTM-38 (AEGIS 5.0, Intercept Flight Test)	3	2021	3	2021
GT-21 Sprint 4 (BMDS Ground Test)	3	2021	3	2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
--	---	--

Events	Start		End	
	Quarter	Year	Quarter	Year
FTT-21 (TH, Intercept Flight Test)	4	2021	4	2021
GT-21 Sprint 5 (BMDS Ground Test)	4	2021	4	2021
GT-21 Sprint 6 (BMDS Ground Test)	4	2021	4	2021
FTG-18 (GM, Intercept Flight Test)	1	2022	1	2022
GT-22 Sprint 1 (BMDS Ground Test)	1	2022	1	2022
GT-22 Sprint 2 (BMDS Ground Test)	2	2022	2	2022
GT-22 Sprint 3 (BMDS Ground Test)	2	2022	2	2022
FTM-35 (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
FTM-37 (IOT&E) (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
GT-22 Sprint 4 (BMDS Ground Test)	3	2022	3	2022
GTD-22 (E/C) (BMDS Ground Test)	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>	300.964	96.140	116.552	103.440	-	103.440	114.132	120.070	125.220	127.736	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

C2BMC Development Support provides operations engineering, integrated logistics, warfighter integration, deployment, and disposal of the current operational system and/or systems fielded in STRATCOM, NORTHCOM, PACOM, EUCOM, and CENTCOM and the operation of the C2BMC Control Center. This activity provides continuous support of the development, deployment, sustainment of the C2BMC training systems, and updates training material to stay current with fielded capabilities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Operations Engineering	72.192	91.771	82.779
Articles:	-	-	-
<p>Description: This activity funds C2BMC support of current operational, test, and training systems. Recurring efforts include:</p> <ul style="list-style-type: none"> - On-site maintenance, help-desk support, and developer reach-back support to ensure operational availability - C2BMC Command Center (CCC) 24 hours a day, 365 days a year operations providing system and network monitoring, system administration, and network defense against cyber-attacks - Integrated logistics support by providing a secure supply chain; reliability, availability, and maintainability (RAM) engineering; obsolescence engineering; and sparing to ensure operational availability - Cybersecurity engineering providing C2BMC Commercial-off-the-shelf (COTS) software/hardware updates and CCC upgrades that address system vulnerabilities - Information System Security Officers (ISSOs) ensuring C2BMC compliance with latest cybersecurity requirements and policies - System modifications driven by Warfighter Improvement Process (WIP), Continuous Improvement Process (CIP), RAM and obsolescence engineering, and external systems such as SBIRS, GMD Fire Control (GFC), Aegis, Terminal High Altitude Area Defense (THAAD), Navy Link Monitoring and Management Tool (LMMT), AN/TPY-2, Standard Army Com (STACOM), DISA fiber networks, and Allied/Coalition interfaces 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - CCMD integration providing C2BMC training, on-site Subject Matter Experts (SMEs), and surge SME support for real-world events, flight tests, ground tests, exercises, cyber assessments, and wargames - Facility modifications required to house current or future C2BMC equipment and transportation for moving C2BMC equipment - Integrated product support for tactical satellite communications (SATCOM) used in flight tests, hardened SATCOM, and associated shelters - Provide transportation for flight test equipment and SME support and analysis for numerous test, exercise, and real world events - Field quarterly updates to commercial-off-the-shelf software/hardware to reduce system COTS component vulnerability to cyber attack <p>Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Achieved Operational Availability of 99% - Fielded software upgrades to STRATCOM, NORTHCOM, and PACOM that updated threat systems and improved discrimination capability - Completed installation of hardened SATCOM at site KCS in PACOM and 2nd hardened SATCOM at Ramstein AB in EUCOM - Updated interfaces with AN/TPY-2, SBIRS operational & test systems, and supported SBIRS Increment 2 soak period - Re-engineered interfaces to support DISA network transition in STRATCOM, NORTHCOM, and PACOM - Added redundant communications circuits and interface with Japan at the request of PACOM - Upgraded distributed training instructor interface for EUCOM and CENTCOM based on warfighter feedback - Participated in Director, Operational Test and Evaluation (DOT&E) sponsored cybersecurity penetration testing and CCMD cyber events - Upgraded training systems to incorporate more robust cybersecurity monitoring capabilities - Completed tech refresh of SATCOM interfaces in NORTHCOM - Completed facility modifications for NORTHCOM and PACOM - Conducted tech refresh of tactical SATCOM used in flight tests. <p>FY 2017 Plans:</p> <p>The increase in funding from FY 2016 to FY 2017 is attributed to realigning funds from the Development & Deployment project (MD01) to Development Support project (MX01) to better align resources with scope of work for the install and maintenance of both MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) and Enhanced Homeland Defense (Spiral 8.2-1) operations. The increase also included funding required to integrate BMDS communications infrastructure at PACOM from DISA.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Sustain Operational Availability - Provide recurring proficiency training to CCMDs and keep training material and systems consistent with operational capabilities - Field software upgrades to EUCOM and CENTCOM that updated threat systems and improved discrimination capability - Field leap second timing adjustment patch to all operational, test, and training systems in all CCMDs - Re-engineer interfaces to support DISA network transition in EUCOM and CENTCOM - Complete tech refresh of SATCOM interfaces in PACOM, EUCOM, and CENTCOM - Complete facility modifications for EUCOM and CENTCOM. <p>FY 2018 Plans: The decrease in funding from FY 2017 to FY 2018 is attributed to the transition of the Transportable Radar Communications Complex (TRCC) and Modernization of Enterprise Terminal Transportable (MET-T) in PACOM, where the Army is assuming support responsibilities for program support of these communications capabilities.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Maintain high Operational Availability. - Maintain MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) in EUCOM/CENTCOM and Enhanced Homeland Defense (Spiral 8.2-1) in NORTHCOM/PACOM. - Provide recurring proficiency training to CCMDs and kept training material and systems consistent with operational capabilities. - Decommission MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) in STRATCOM, NORTHCOM, and PACOM. 			
<p>Title: Concurrent Test, Training, and Operations (CTTO)</p> <p align="right">Articles:</p> <p>Description: This element provides the development and sustainment of the C2BMC Training Support System (TSS), MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) / Enhanced Homeland Defense (Spiral 8.2-1) / EPAA Phase 3/EOR (Spiral 8.2-3) Distributed Training System (DTS) (formerly known as the Distributed Multi-Echelon Training System (DMETS) for PACOM, NORTHCOM, EUCOM, and CENTCOM. C2BMC connects all BMDS Elements through virtual and physical networks to facilitate integrated test, training, and operations within two coexistent realms - Operations and Certification. This enables the warfighter to become proficient on current and future software versions at the operational console; increases the developer's capacity to perform a variety of tests and upgrades on the operational BMDS; and decreases recall-to-mission operations times from weeks and days to hours and minutes. Recurring accomplishments include sustaining current training systems for BMDS training events</p>	23.948	24.781	20.661
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>for the Unified Combatant Command developing the next generation training systems, to include the integration of Red Force / Blue Force capability, to keep current with the operational system capabilities. Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Deployed MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) TSS. - Developed Enhanced Homeland Defense (Spiral 8.2-1) TSS, incorporating complete redesign of operational screens, updated GM screens, updated algorithms and models to reflect the latest BMDS capability. - Developed Enhanced Homeland Defense (Spiral 8.2-1) DTS, incorporating a complete architecture change from the standalone training architecture used in MRBM Defense/EPAA Phase 1 and 2 (Spiral 6.4) to operating as an integrated part of the operational distribution system. <p>FY 2017 Plans:</p> <p>The increase in funding from FY 2016 to FY 2017 is attributed to the deployment of Enhanced Homeland Defense (Spiral 8.2-1) TSS and DTS while simultaneously initiating development of EPAA Phase 3/EOR (Spiral 8.2-3) TSS and DTS.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). - Deploy and sustain C2BMC Enhanced Homeland Defense (Spiral 8.2-1) TSS. - Deploy C2BMC Enhanced Homeland Defense (Spiral 8.2-1) DTS. - Initiate development efforts for C2BMC EPAA Phase 3/EOR (Spiral 8.2-3) TSS that includes Cross Area of Responsibility (XAOR) and BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA) updates and Public Key Infrastructure (PKI) implementation. - Initiate development efforts for C2BMC EPAA Phase 3/EOR (Spiral 8.2-3) DTS that includes Modernized Integrated Database (MIDB) interface updates, Ground Based Midcourse Defense Command Launch Equipment (GMD CLE) updates, and update Hardware-in-the-Loop (HWIL) connectivity. - Initiate development efforts for C2BMC LRDR for Homeland Defense (Spiral 8.2-5) TSS that include the Integrated Air and Missile Defense Battle Command System (IBCS). <p>FY 2018 Plans:</p> <p>The decrease in funding from FY 2017 to FY 2018 is attributed to the planned decommissioning of the legacy DMETS upon completion of Enhanced Homeland Defense (Spiral 8.2-1) DTS deployment resulting in reduced development/upgrade efforts.</p> <ul style="list-style-type: none"> - Conduct activities listed in Description section (above). 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Deploy and sustain C2BMC EPAA Phase 3/EOR (Spiral 8.2-3) TSS.			
- Deploy and sustain C2BMC EPAA Phase 3/EOR (Spiral 8.2-3) DTS.			
Accomplishments/Planned Programs Subtotals	96.140	116.552	103.440

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	197.617	209.072	230.162	-	230.162	194.328	253.778	264.377	267.254	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603893C: <i>Space Tracking and Surveillance System</i>	27.262	32.129	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	21.040	20.690	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
--	---	--

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

Remarks

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems was the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of five years through 1st quarter FY 2017. Spiral 8.2 will be fielded in three separate increments. Enhanced Homeland Defense (Spiral 8.2-1) will be fielded in FY 2018, fielding of EPAA Phase 3/EOR (Spiral 8.2-3) in FY 2019, and completion of system deployment with LRDR for Homeland Defense (Spiral 8.2-5) in FY 2021. This incremental fielding required a modification to the base contract increasing the ceiling by \$870 million and adding an additional five-year ordering period to extend the contract through first quarter FY 2022. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber ops support of the C2BMC system. They perform development and testing of C2BMC products in Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operations Engineering - Indirect Support	MIPR	DISA DECC/DISA TECC : Various	28.214	7.959		6.890	Oct 2016	4.177	Oct 2017	-		4.177	Continuing	Continuing	Continuing
Operations Engineering - Operations Engineering - Unit Personnel, Control System Improvement Sustaining Support	MIPR	Army, Navy, Air Force : Various	0.000	0.000		0.912	Oct 2016	7.081	Oct 2017	-		7.081	Continuing	Continuing	Continuing
Operations Engineering - Operations Engineering Training Support	SS/CPAF	Northrup Grumman : Boeing Huntsville, AL	0.000	0.000		1.747	Nov 2016	1.869	Nov 2017	-		1.869	Continuing	Continuing	Continuing
Operations Engineering - Teleport Sustainment	MIPR	Various : Various	7.505	0.000		0.000		0.000		-		0.000	0	7.505	7.505
Operations Engineering - Unit Personnel, Control System Improvement Sustaining Support	SS/CPFF	Lockheed Martin Team : Huntsville, AL	207.993	64.233		82.222	Dec 2016	69.652	Dec 2017	-		69.652	Continuing	Continuing	Continuing
Concurrent Test, Training, and Operations (CTTO) - CTTO/Training Enhancements	MIPR	Army : Various	0.000	0.000		8.238	Dec 2016	7.081	Dec 2017	-		7.081	Continuing	Continuing	Continuing
Concurrent Test, Training, and Operations (CTTO) - Concurrent Test, Training And Operations	SS/CPAF	Northrop Grumman : Boeing	3.875	0.735		0.000		0.000		-		0.000	0	4.610	4.610
Concurrent Test, Training, and Operations (CTTO) - Concurrent Test, Training, and Operations	SS/FPAF	COLSA ARC : Huntsville, AL	0.000	3.833		0.000		0.000		-		0.000	0	3.833	3.833
Concurrent Test, Training, and Operations (CTTO) - Training Enhancements	SS/CPIF	Lockheed Martin Team : Huntsville, AL, Colorado Springs, CO	53.377	19.380		16.543	Dec 2016	13.580	Dec 2017	-		13.580	Continuing	Continuing	Continuing
Subtotal			300.964	96.140		116.552		103.440		-		103.440	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
--	---	--

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	300.964	96.140	116.552	103.440	-	103.440	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆																
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 8%;">FY 2016</th> <th style="width: 8%;">FY 2017</th> <th style="width: 8%;">FY 2018</th> <th style="width: 8%;">FY 2019</th> <th style="width: 8%;">FY 2020</th> <th style="width: 8%;">FY 2021</th> <th style="width: 8%;">FY 2022</th> </tr> </thead> <tbody> <tr> <td>MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support</td> <td>◇</td><td>◇</td><td>◇</td><td>◇</td><td>◇</td><td>◇</td><td>◇</td> </tr> </tbody> </table>						FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support	◇	◇	◇	◇	◇	◇	◇
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022													
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support	◇	◇	◇	◇	◇	◇	◇													

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MD40 / <i>Program-Wide Support</i>		
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	73.261	14.798	19.771	18.782	-	18.782	21.164	22.020	22.824	23.185	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016, FY 2017, and FY 2018 Program Wide Support reflects proportional changes as a result of budget changes to the Ballistic Missile Defense Command and Control, Battle Management & Communication program. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and / or civilian salaries on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA-wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	14.798	19.771	18.782
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
N/A			
Accomplishments/Planned Programs Subtotals	14.798	19.771	18.782

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	1.955	1.624		0.395	Jul 2017	0.376	Jul 2018	-		0.376	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPRs)	MIPR	Various : Multi: AK/AL/CA/CO/HI/MD/VA/NJ/NY/OCONUS	3.111	0.000		0.000		0.000		-		0.000	0.015	3.126	0
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL, CA, CO, HI, VA	2.088	0.859		1.571	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Various : Multi: AK, AL, CA, CO, HI, VA	22.388	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Various : Multi: AK, AL, CA, CO, VA	40.919	6.126	Nov 2015	0.819	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services Civilian Salaries, Travel, Training	Allot	Various : Multi: AL, CA, CO, VA	2.800	6.189	Nov 2015	16.477	Nov 2016	18.406	Nov 2017	-		18.406	2.800	46.672	0
Program Wide Support - Agency Operations, Sustainment and GPC	Allot	Various : Multi: AL, CO, VA etc.	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Facilities Maintenance SRM	MIPR	Various : Multi: AK, CA, CO, AL, MD, NJ, VA	0.000	0.000		0.509	Jan 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			73.261	14.798		19.771		18.782		-		18.782	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	73.261	14.798	19.771	18.782	-	18.782	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆							
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇							
					FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
MD40 Program-Wide Support					◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	72.829	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
MD03: <i>Joint Warfighter Support</i>	62.665	14.238	15.417	15.394	-	15.394	15.473	16.576	16.849	17.191	Continuing	Continuing
MT03: <i>Joint Warfighter Support Test</i>	1.051	31.148	30.423	31.206	-	31.206	31.504	33.445	33.973	34.664	Continuing	Continuing
MC03: <i>Cyber Operations</i>	-	0.000	0.000	0.152	-	0.152	0.155	0.157	0.160	0.162	0	0.786
MD40: <i>Program-Wide Support</i>	9.113	2.180	1.936	2.202	-	2.202	2.392	2.450	2.591	2.619	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The Joint Warfighter Support Program (JWSP) is Missile Defense Agency's primary means for providing direct technical support to Combatant Commands (CCMDs), the Military Services and the Joint Staff on Ballistic Missile Defense System (BMDS) development, testing, and operational support, to include real world testing and validation of the warfighter's operational Integrated Broadcast Service (IBS). It enables delivery of BMDS capabilities to Warfighters and ensures their participation in identification and development of new Ballistic Missile Defense (BMD) capabilities via the Warfighter Involvement Process (WIP). The JWSP allows the Warfighter and Missile Defense Agency to work together to identify gaps, seams, and needs in warfighting capability and enhance BMDS attributes by submitting modification and fielding requests. It also provides 24 hours a day, 365 days a year BMD operational support to Warfighters worldwide. The program enables rapid response to Warfighter Requests for Information (RFIs) and Requests for Analyses (RFAs), which are especially critical to mission success in protecting U.S. forces and other defended assets during "Real World" threat events. The program supports improving products delivered to Warfighters through technical reviews and technical analyses supporting strategic and regional BMD planning, development of shot doctrine and BMD defense design. The JWSP also enables the inclusion of both CCMD and MDA BMD objectives in CCMD/Joint Staff-sponsored wargames and exercises, which are used to sharpen and enhance joint BMD warfighting skills.

MD40 Program-Wide Support (PWS) consists of essential non-headquarters management efforts providing integrated and efficient support to MDA functions and activities across the entire BMDS.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	47.898	47.776	49.621	-	49.621
Current President's Budget	47.566	47.776	48.954	-	48.954
Total Adjustments	-0.332	0.000	-0.667	-	-0.667
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.332	0.000			
• Other Adjustment	0.000	0.000	-0.667	-	-0.667

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD03: <i>Joint Warfighter Support</i>	62.665	14.238	15.417	15.394	-	15.394	15.473	16.576	16.849	17.191	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

There are six primary functions in Joint Warfighter Support (MD03):

- (1) Current Operations Support
- (2) Combatant Command Support
- (3) Military Department Engagement
- (4) Operational BMDS Verification and Validation
- (5) Warfighter Training Support
- (6) Joint Staff Engagement

Detailed descriptions and accomplishments are provided in the following section.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Strategic Warfighter Integration	14.238	15.417	15.394
Articles:	-	-	-
Description: (1) Current Operations Support: - Manages and operates MDA Operations Support Center (OSC) 24 hours a day, 365 days a year and two MDA Operations Centers (MOCs) in VA and AL 16 hours a day, 5 days a week which coordinates BMDS configuration changes (historical average: 3000 per year); daily execution of scheduled BMDS activities (historical average: 32,000 per year); monitors, captures and reports scheduled			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>and unscheduled outages; prepares and transmits Logistic Reports (LOGREPs, approx. 500 per year); monitors health and status of deployed BMDS assets, and provides Critical Information Reports</p> <ul style="list-style-type: none"> - Manages and executes BMDS Asset Management (BAM) scheduling and execution process; publishes daily schedule encompassing sustainment, testing, upgrade and training activities for missile warning, space situational awareness, and homeland and regional defense assets (historical averages: 900 events; 1,260 revisions; 4,430 schedule change requests) - Collects and reports BMDS operational availability and readiness data - Leads MDA Operations Support Planning Team (OSPT) an MDA-wide task force supporting Warfighters, Services and the Joint Staff to address real-world contingencies and crisis events - Leads Warfighter RFA/RFI staffing and processing (average 30 RFIs / 44 RFAs annually) - Plans and executes continuity of operations activities ensuring continuous execution of mission essential functions - Develops BMDS Annual Plan and BMDS Operating Schedule facilitating key stakeholder coordination and maximizing operational availability of the BMDS - Develops and maintains the Integrated Scheduling Tool - Facilitates major software/hardware additions to the Operational Capacity Baseline for homeland/regional defenses - Develops and maintains the BORRS application to collect and report BMDS operational availability and readiness data through the network-based tool to distribute data to OSD, CCMDs, Joint Staff, Military Services, and BMDS Operators - Provides certification training to BMDS watch officers (BWO), BMDS Safety Officers (BSO), and other Operations Support Center staff (includes over 1,300 sustainment and initial qualification training hours annually) - Develops/publishes the BMDS Handbook to aid Warfighter understanding of capabilities and limitations of the fielded BMDS <p>(2) Combatant Command Support (USSTRATCOM, USNORTHCOM):</p> <ul style="list-style-type: none"> - Supports the WIP and other MDA Warfighter engagement efforts by assisting Warfighters in their update to the annual BMDS Prioritized Capabilities List (PCL) and Modification and Fielding Request List (MFRL) reflecting changes in CCMD and Service priorities for needed BMDS enhancements to address a full range of CCMD needs - Shares BMDS information and knowledge with CCMDs to help develop common BMDS operational procedures - Coordinates with CCMDs and schedules Missile Defense executive forums (Operations Forces Standing Committee; Missile Defense Executive Board) to facilitate program decisions 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>- Supports Assistants to the Director (ATDs) and Liaison Officers (LNOs) in communication with CCMD staffs on BMDS capabilities and deployments</p> <p>- Supports Joint Functional Component Command Integrated Missile Defense (JFCC IMD) integration by participating in the Warfighter Forum (WFF); a multi-lateral information and decision event to address CCMD, Service and DoD BMDS equities.</p> <p>- Assists USNORTHCOM in broadening homeland defense planning to address the full range of USNORTHCOM threats by conducting the Homeland Defense Architecture Working Group (HDAWG) and Shot Management Analysis Cell (SMAC).</p> <p>- Supports BMD senior leader forums as well as asset management, test, training, and exercises</p> <p>(3) Military Department Engagement:</p> <p>- Facilitates and coordinates Service Boards of Directors (BODs) on Lead Service BMDS related equities, POM development and execution; and element fielding, operations and maintenance</p> <p>- Maintains daily, strategic-level interfaces with Military Services and Joint Staff; plans for the delivery, fielding, and operation of respective Lead Service BMDS capabilities via senior-level working groups, General Officer Air and Missile Defense and Space forums; and maintains close coordination with respective lead Service counterparts regarding BMDS resource, logistic and training element annexes</p> <p>- Supports and provides the BMDS capability delivery process and transition and transfer to the Military Services through participation in senior-level working groups, Joint staff directorates and facilitates General Officer forums and, ; ensures successful transfer of BMDS solutions to the warfighter-</p> <p>- Provides planner-level coordination for Joint Staff and interagency staff actions to ensure Joint Staff Action Packages of warfighter plans, orders, and doctrine to synchronize Agency and MILDEP positions</p> <p>- Coordinates internal Agency RFA/RFI responses to senior Service, CCMD, and Joint staff working groups; allows informed decisions related to BMDS operational, logistic, training and maintenance concerns</p> <p>(4) Operational BMDS Verification and Validation</p> <p>- Provides 24 hours a day, 365 days a year, global system verification and validation operational Integrated Broadcast Service, Common Integrated Broadcast, and Shared Early Warning System for BMD early warning data.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>- Supports Tactical Data Processor software development, MDA flight tests and other software development efforts using live real-world broadcasts of simulated missile threats</p> <p>- Support Naval Board of Inspection and Survey (INSURV), Shipboard installation, Aegis On-Demand, Aegis program releases, US and Coalition operational readiness and BMD Exercise requirements to validate equipment, materiel, and tactical readiness while simultaneously providing deployment certification and crew operator qualification; verifies operational readiness of both US and Coalition partners to detect a real-world launch of a ballistic threat</p> <p>(5) Warfighter Training Support:</p> <ul style="list-style-type: none"> - Provides Missile Defense Space Warning tool (MDST) support to increase operator proficiency, competence, and confidence; providing initial qualification training for BWOs and BMDS Safety Officers; develop and provide bi-weekly sustainment training to watch officers to maintain proficiency and understanding of the BMD - Provides technical and programmatic updates for BMD Warfighter training -Participates in BMD training and Education Working Group to coordinate BMD training issues with USSTRATCOM and Joint Staff. - Provides 25,000 hours (up to 24 hours a day, 365 days a year) of MDST support for over 170 exercise and training events annually to CCMDs, Military Services and Coalition partners comprised of more than 100,000 simulated exercise missile launches - Supports warfighter training and validation and Crew Operational Readiness Inspection (ORI) / Inspector General Certifications. - Supports Fleet Synthetic and Aegis Operator Training to ensure operational readiness of Aegis as the first step in the kill chain for BMD (3000+ hours annually) - Provides Early Warning missile injects for all MT03 wargames and exercises and tailored support for other Joint Warfighter Support Test events (listed in MT03 R-4) <p>(6) Joint Staff Engagement</p> <ul style="list-style-type: none"> - Facilitates and coordinates all Joint Staff interactions with the MDA - Maintains daily, strategic-level interfaces with the Joint Staff - Provides critical information required to plan for fielding and operation of BMDS capabilities - Coordinates Joint Staff inquiries into RFA/RFIs <p>FY 2016 Accomplishments:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
See Above			
FY 2017 Plans: See Above			
FY 2018 Plans: See Above			
Accomplishments/Planned Programs Subtotals	14.238	15.417	15.394

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	21.040	20.690	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0901598C: <i>Management HQ - MDA</i>	35.871	31.160	29.947	-	29.947	28.024	27.269	27.878	28.450	Continuing	Continuing

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>

D. Acquisition Strategy

Missile Defense Agency will continue to enable effective delivery of Ballistic Missile Defense System capabilities to the Warfighter by ensuring their participation in the identification and development of new capabilities via the Warfighter Involvement Process.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Strategic Warfighter Integration - Strategic Warfighter Integration - HR A&AS	C/CPFF	MiDAESS : Colorado Springs	0.140	0.139		0.143	Nov 2016	0.147	Aug 2018	-		0.147	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - IC A&AS	C/CPFF	MiDAESS : Huntsville	0.218	0.226		0.232	Mar 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - Administrative A&AS	C/CPFF	MiDAESS : Colorado Springs	1.032	0.114	Oct 2015	0.116	May 2017	0.252	May 2018	-		0.252	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - Asset Management Server Maintenance	C/CPAF	JRDC : Colorado Springs, Huntsville	2.164	0.519	Nov 2015	0.582	Nov 2016	0.530	Nov 2017	-		0.530	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - Civilian Salaries/ Operations Sustainment	Allot	MDA : Colorado Springs/Huntsville, NCR	22.718	3.898	Oct 2015	4.123	Oct 2016	4.205	Oct 2017	-		4.205	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic	C/CPAF	JRDC : Colorado Springs	12.068	2.539	Nov 2015	3.162	Oct 2016	3.056	Nov 2017	-		3.056	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Warfighter Integration - Current Operations															
Strategic Warfighter Integration - Strategic Warfighter Integration - MDST	C/CPAF	JRDC : Colorado Springs	13.936	1.589	Nov 2015	1.963	Oct 2016	2.180	Nov 2017	-		2.180	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - Travel and Training	Allot	MDA : Colorado Springs, Huntsville, NCR	0.719	0.213	Oct 2015	0.200	Oct 2016	0.225	Oct 2017	-		0.225	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - Warfighter Support A&AS	C/CPFF	MiDAESS : Colorado Springs, Huntsville, NCR	9.670	5.001	Oct 2015	4.896	Oct 2016	4.799	Jun 2018	-		4.799	Continuing	Continuing	Continuing
Subtotal			62.665	14.238		15.417		15.394		-		15.394	-	-	-

Remarks

N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>
--	---	--

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	62.665	14.238		15.417		15.394		-		15.394	-	-	-

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022			
Strategic Integration Wargame Events	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD03 / <i>Joint Warfighter Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Strategic Integration Wargame Events	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>				Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT03: <i>Joint Warfighter Support Test</i>	1.051	31.148	30.423	31.206	-	31.206	31.504	33.445	33.973	34.664	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Joint Warfighter Support Test is comprised of two primary responsibilities: wargames and exercises and warfighter operational support.

Wargames and exercises:

- Support the Warfighter to plan and conduct worldwide wargames and exercises supporting BMDS development and fielding.
- Enable the Warfighter to define, test, deploy, and employ new missile defense capabilities.
- Support JFCC-IMD BMDS table top exercises to facilitate the global missile defense capability and to refine the European capability concept of operations through low-fidelity demonstration Models & Simulation (M&S).
- Examine current and future BMDS operational capabilities for Geographic (i.e., USCENTCOM, USEUCOM, and USPACOM) and Strategic (i.e., USNORTHCOM and USSTRATCOM) Combatant Commands (CCMDs).
- Complete test planning for BMDS events as shown in the Exhibit R-4 schedule.

Warfighter operational support (program planning and operations):

- Prepare MDA senior leadership for engagements with the Geographic Combatant Commands (GCCs) by providing logistical support and developing briefings for the GCC Assistant Test Directors (ATDs) and MDA Director.
- Interface with the GCCs on BMD operational issues by providing planning and analysis support and capturing/transmitting GCC Request for Analysis/Request for Information (RFA/RFIs).
- Support GCC contingency activation planning for real-world contingencies and theater security cooperation programs by supervising the activation of MDA assets to use in the operational BMDS.
- Aid GCC participation in BMDS capability definition, design, development, integration, and delivery processes through the Warfighter Involvement Process (WIP) to synchronize capability delivery with operational readiness and acceptance.
- Provide resource management and administration of MT03 personnel and funding.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Wargames and Exercises	24.058	23.516	24.161
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Description: The Missile Defense Agency will continue to focus on providing operational-level interfaces to the Global Combatant Commands (GCCs) and increasing Warfighter participation to develop future missile defense capabilities as listed in FY 2016 accomplishments and FY 2017 Base Plans.</p> <p>The MDA will continue to enhance Warfighter operational support through internal support activities and proactive execution of Combatant Command (CCMD) interface activities.</p> <ul style="list-style-type: none"> - Work with CCMDs on the inclusion of Allies and regional partners into MDA Ground and Flight tests, and wargame & exercise simulations. - Provide warfighter training simulations in direct support of flight and ground tests. - Serve as liaison between internal MDA organizations and the Joint Functional Component Commander for Integrated Missile Defense (JFCC-IMD) across all functional areas to facilitate Geographic Combatant Command (GCC) participation in the BMDS capability definition, design, development, integration and delivery processes. - Support JFCC IMD and EUCOM in the European Phased Adaptive Approach (EPAA) implementation process through the planning, testing, integration and execution of BMDS wargames and exercises. - Support Joint Staff integration of MDA models into Tier I events through the JOINT, LIVE VIRTUAL CONSTRUCTIVE (JLVC) campaign. - Work with Program Offices and the Warfighter; publish a Concept of Operations that will support future MDA Models and Simulation (M&S) support to BMD wargames and exercises. - Coordinate and integrate CCMD requirements into the BMDS Integrated Master Test Plan. - Support the GCC Assistants to the Director (ATDs) and Liaison Officers (LNOs). - Provide support to the development and update of Ballistic Missile Defense (BMD) portions of CCMD Operation Plans (OPLANS) and Contingency Plans (CONPLANS). - Engage in MDA/GCC interface and synchronization of information regarding capabilities and security cooperation strategies. - Develop and provide Table Top Exercises (TTX) in support of CCMD-specific scenarios to include: <ul style="list-style-type: none"> o TTX: BMDS Wargame TTX with each CCMD, two PACOM Multilateral TTX (US/JPN/ROK), PACOM Bilateral TTX (US/AUS), NATO NAC TTX, and STRIKFORNATO TTX. o Support through the planning, testing and execution of developer, policy and familiarization wargames to include: Wargames: BMDS Wargame 17 (planning events), NIMBLE TITAN 16, NIMBLE FIRE 16A, NIMBLE FIRE 16B - Conduct planning, testing, integration and execution of CCMD-supported globally-executed BMDS exercises to include the following (by GCC): <ul style="list-style-type: none"> EUCOM: BLUE FLAG 16-1, JOINT TASK FORCE-ISRAEL COMMAND POST EXERCISE, CROSS-AOR AIR AND MISSILE DEFENSE EXERCISE 16, STEADFAST ALLIANCE 16, HOST NATION EXERCISE 16 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

PACOM: KEEN EDGE 16, FLEET SYNTHETIC TRAINING-JOINT 16-71, KEY RESOLVE 16, ULCHI FREEDOM GUARDIAN 16, PACIFIC SENTRY 16
 CENTCOM: AIR AND MISSILE DEFENSE EXERCISE (AMDEX) 16-1, JOINT AIR DEFENSE EXERCISE (JADEX) 16-1, JADEX 16-2, AMDEX 16-2, JADEX 16-3, ARABIAN GULF SHIELD
 NORTHCOM/JFCC-IMD/STRATCOM: VIGILANT SHIELD/GLOBAL THUNDER 16

Additional GCC interface activities by region will include:

USEUCOM Engagement:

- Coordinate with USEUCOM for continued MDA support of key European Phased Adaptive Approach milestones in order to provide a full range of BMDS capabilities addressing ballistic missile threats to the European theater.
- Work with USEUCOM to include NATO Allies and regional partners during MDA Ground tests, Flight tests, Wargames, and Exercises in order to improve Allied - US BMDS interoperability.
- Coordinate with MDA program elements to facilitate rapid agency responses to USEUCOM requests for analysis and information. Provide reach-back support for the MDA ATD and LNO in USEUCOM for activities requiring visibility by the MDA Director and Director for Test.
- Coordinate with MDA Global Deployment Program Office to plan and execute actions required for deployment of BMDS assets in the USEUCOM AOR.
- Synchronize MDA EPAA Phase II and III deployment plans with Warfighter Operational Readiness and Acceptance (OR&A) efforts in support of the European Phased Adaptive Approach.
- Prepare MDA Senior Leadership for engagements with the USEUCOM. Support MDA Senior Leadership Engagements including the USEUCOM Senior Leader Forum, CY2015 Multinational Conference, and multiple other engagements.

USCENTCOM Engagement:

- Assist CCMD leadership to develop a regional partner data sharing system supporting USCENTCOM regional IAMD architecture development.
- Coordinate with MDA program elements; assist in planning and execution activities supporting USCENTCOM and improving interoperability with regional partners.
- Provide reach-back support to the USCENTCOM ATD and LNO in USCENTCOM activities requiring visibility by senior MDA leadership to include the MDA Director.
- Support all cross-AOR planning and execution activities.
- Coordinate with MDA Deployment Program Office, planned and executed activities required for deployment of BMDS assets and components in the USCENTCOM AOR.
- Manage MDA and USCENTCOM interface activities.

FY 2016	FY 2017	FY 2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>USPACOM Engagement:</p> <ul style="list-style-type: none"> - Share operational information and knowledge in order to increase allied interoperability - Support BMD training, wargames, and exercises with Australia, Taiwan, Japan and South Korea. - Assist USPACOM leadership to broaden Phased Adaptive Approach planning to address a full range of threats and integration of allies into the BMDS. - Coordinate with MDA program elements; assist in planning and execution activities supporting USPACOM's regional partners. - Provide reach-back support to the USPACOM ATD and LNO in USPACOM activities requiring visibility by the MDA Director and Director of Test. - Coordinate with MDA Global Deployment Program Office, plan and execute activities required for deployment of BMDS assets and components in the USPACOM AOR. - Synchronize MDA-integrated fielding plans with Warfighter Operational Readiness and Acceptance (OR&A) efforts in support of new missile defense capabilities (e.g., Theater High Altitude Area Defense system to South Korea [Jul 2016]). Share operational information and knowledge and help allies develop common operational procedures. - Prepare MDA Senior Leadership for engagements with USPACOM. Support MDA Senior Leadership Engagements in conjunction with wargames, exercises, and ground tests. - Sponsor working groups consisting of appropriate MDA elements and GCC leads to improve processes in order to efficiently address cross organizational requirements and taskers. - Plan and execute all wargame and exercise events per the R-4/4A schedule. <p><i>FY 2016 Accomplishments:</i> The MDA continued to enhance Warfighter operational support through internal support activities and proactive execution of Combatant Command (CCMD) interface activities as stated in the Description above. Addendum activities completed in FY 2016 are as follows:</p> <ul style="list-style-type: none"> - Synchronized MDA-integrated fielding plans with Warfighter Operational Readiness and Acceptance (OR&A) efforts in support of new missile defense capabilities (i.e. Theater High Altitude Area Defense system to South Korea [Jul 2016]). Shared operational information and knowledge to help allies develop common operational procedures. - Prepared MDA Senior Leadership for engagements with USPACOM. Supported MDA Senior Leadership Engagements in conjunction with wargames, exercises, and ground tests. <p><i>FY 2017 Plans:</i> SEE ABOVE</p> <p><i>FY 2018 Plans:</i></p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
SEE ABOVE				
Title: Program, Planning and Operations		7.090	6.907	7.045
		Articles:	-	-
<p>Description: The MDA will continue to focus on providing operational-level interface to the GCCs and increasing Warfighter participation in the development of future missile defense capabilities. The key Warfighter interface activities include:</p> <p>MDA Operational Support:</p> <ul style="list-style-type: none"> - Support OSPT activation during heightened period of interest. - Support Warfighters, DoD Agencies, and Military Services in identifying desired missile defense capabilities and characteristics. - Obtain Warfighter participation and advice on desired operational features and approaches to system fielding throughout development. - Track analysis and responses for CCMD Requests for Analysis (RFA) and Requests for Information (RFI). - Serve as the immediate link between MDA and the GCCs on all Warfighter activities and requirement. - Prepare MDA senior leadership for U.S. Army, Navy, and Air Force BOD meetings and AMD General Officer Steering Committee meetings. - Coordinate MDA and GCC participation in BMDS capability definition, design, development, and integration. - Provide resource management and administration of BMDS Warfighter personnel and budget. - Support and staff the HMOC during surge operations and sustained 24 hours per day/7 days per week of MDA operations. - Manage travel, including travel to support the wargames and exercises and the Assistant to the Director (ATDs) and Liaison Officer (LNOs) as MDA representatives at the GCC HQs. <p>FY 2016 Accomplishments: The MDA continued to focus on providing operational-level interface to the GCCs and increasing Warfighter participation in the development of future missile defense capabilities as stated in the Description above.</p> <p>FY 2017 Plans: SEE ABOVE.</p> <p>FY 2018 Plans: SEE ABOVE.</p>				
Accomplishments/Planned Programs Subtotals		31.148	30.423	31.206
C. Other Program Funding Summary (\$ in Millions)				
N/A				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

In order to optimize the performance of the Ballistic Missile Defense System, MDA leverages Defense Department executive agents as well as the MDA Joint National Integration Center Research and Development (JRDC) contract.

The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution to the BMDS. Products and Services will be acquired by competitive means to the extent that is possible and practical.

In 2017, the MDA JRDC contract is scheduled to be recompeted and will be called the Integrated Research and Development for Enterprise Solutions (IRES).

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Wargames and Exercises - Combatant Commanders (COCOM) Support	C/CPAF	JRDC/MIPR : Colorado Springs, Huntsville, NCR	0.000	18.240	Nov 2015	16.650	Nov 2016	17.158	Nov 2017	-		17.158	Continuing	Continuing	Continuing
Wargames and Exercises - Wargame Support	C/CPAF	JRDC/MIPR : Colorado Springs	0.000	5.818	Nov 2015	6.866	Nov 2016	7.003	Nov 2017	-		7.003	Continuing	Continuing	Continuing
Program, Planning and Operations - Civilian Salaries/Operations Sustainment	Allot	MDA : Colorado Springs, Huntsville, NCR	0.000	2.343		2.543		2.594	Oct 2017	-		2.594	Continuing	Continuing	Continuing
Program, Planning and Operations - Combatant Commanders (COCOM) Support A&AS	C/CPFF	MiDAESS : Colorado Springs, Huntsville, NCR	0.000	1.049		0.998		1.018	Oct 2017	-		1.018	Continuing	Continuing	Continuing
Program, Planning and Operations - Government Travel & Training	Allot	MDA : Colorado Springs, Huntsville, NCR	0.000	0.650		0.850		0.867	Oct 2017	-		0.867	Continuing	Continuing	Continuing
Program, Planning and Operations - Support to MDA Leadership A&AS	C/CPFF	MiDAESS : Colorado Springs, Huntsville, NCR	1.051	3.048		2.516		2.566	Oct 2017	-		2.566	Continuing	Continuing	Continuing
Subtotal			1.051	31.148		30.423		31.206		-		31.206	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.051	31.148	30.423	31.206	-	31.206	-	-	-

Remarks
Prior year funding was captured in MD03 budget project.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

	Significant Event Complete ▲ Significant Event Planned △	Milestone Decision Complete ★ Milestone Decision Planned ☆	Element Test Complete ◆ Element Test Planned ◇	System Level Test Complete ● System Level Test Planned ○		Complete Activity ◆ Planned Activity ◇													
							FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022						
(EX) Air and Missile Defense Exercise Series 16	▲																		
(WG) Demonstration, Table-top Exercises & Experiments 15	◆																		
(EX) Vigilant Shield/Global Thunder 16	▲																		
(EX) Arabian Gulf Shield (AGS) Event 1 16	▲																		
(EX) KEEN Edge 16	◆	◆																	
(EX) Host Nation 16	◆	◆																	
(WG) Nimble Titan Year 2 16	◆	◆	◆	◆															
(EX) Fleet Synthetic Training-Joint 16		▲																	
(EX) Key Resolve 16		▲																	
(EX) Arabian Gulf Shield (AGS) Event 2 16		▲																	
(EX) Steadfast Alliance 16		◆	◆																
(WG) Demonstration, Table-top Exercises & Experiments 16			◆	◆	◆														
(EX) Joint Air Defense Exercise Series 16				▲															
(EX) Pacific Sentry 16				▲															
(EX) Arabian Gulf Shield (AGS) Event 3 16				▲															
(EX) Ulchi Freedom Guardian 16				▲															
(WG) Space & Missile Defense Symposium 16				▲															
(WG) BMDs Wargames 17				◆	◆	◆	◆												
(WG) Nimble Titan Year 1 18				◆	◆	◆	◆												
(EX) Air and Missile Defense Exercise Series 17						△													
(EX) EPOCH PLANEX 18						△													
(EX) Arabian Gulf Shield (AGS) Event 1 17						△													
(EX) Global Response Exercise (GREx) 17						△													
(EX) European Test Bed 16-1						△													

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

	Significant Event Complete ▲			Milestone Decision Complete ★			Element Test Complete ◆			System Level Test Complete ●			Complete Activity ◆									
	Significant Event Planned △			Milestone Decision Planned ☆			Element Test Planned ◇			System Level Test Planned ○			Planned Activity ◇									
	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022			
(EX) Global Lightning 17				◇	◇																	
(EX) Austere Challenge 17				◇	◇	◇	◇	◇	◇	◇												
(EX) Fleet Synthetic Training-Joint 17					△																	
(EX) Eagle Resolve 17					△																	
(EX) European Air & Missile Defense Exercise Alliance 16					△																	
(EX) Arabian Gulf Shield (AGS) Event 2 17					△																	
(EX) Key Resolve 17					△																	
(EX) European Test Bed 17					△																	
(EX) Steadfast Alliance 17					◇	◇																
(EX) Joint Project Optic Windwill 2017					◇	◇																
(EX) Steadfast Armour 17					◇	◇																
(EX) Joint Live, Virtual, and Constructive 2017					◇	◇	◇	◇														
(WG) Huntsville Wargames 17						△																
(EX) KEEN Sword 17						◇	◇	◇														
(WG) Demonstration, Table-top Exercises & Experiments 17						◇	◇	◇														
(EX) KEEN Edge 18						◇	◇	◇	◇													
(EX) Joint Air Defense Exercise Series 17							◇															
(EX) Arabian Gulf Shield (AGS) Event 3 17							△															
(EX) Pacific Sentry 17							△															
(EX) Ulchi Freedom Guardian 17							△															
(WG) Space & Missile Defense Symposium 17							△															
(WG) Multi-National Missile Defense Conference (MNC) 17							◇	◇														
(EX) Vigilant Shield 18							◇	◇														
(EX) Global Thunder 18							◇	◇														

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022							
(WG) Nimble Titan Year 2 18			◇ ◇ ◇ ◇											
(EX) Air and Missile Defense Exercise Series 18			△											
(EX) EPOCH PLANEX 19			△											
(EX) Arabian Gulf Shield (AGS) Event 1 18			△											
(EX) Host Nation 18			◇ ◇											
(EX) Global Lightning 18			◇ ◇											
(EX) European Air & Missile Defense Exercise Alliance 17			△											
(EX) Arabian Gulf Shield (AGS) Event 2 18			△											
(EX) Key Resolve 18			△											
(EX) European Test Bed 18			△											
(EX) Global Response Exercise (GREx) 18			◇ ◇											
(EX) Steadfast Alliance 18			◇ ◇											
(EX) Joint Live, Virtual, and Constructive 2018			◇ ◇ ◇ ◇											
(WG) Demonstration, Table-top Exercises & Experiments 18				◇ ◇ ◇										
(WG) BMDS Wargames 19				◇ ◇ ◇ ◇ ◇										
(EX) Joint Air Defense Exercise Series 18				△										
(EX) Arabian Gulf Shield (AGS) Event 3 18				△										
(EX) Pacific Sentry 18				△										
(EX) Ulchi Freedom Guardian 18				△										
(WG) Multi-National Missile Defense Conference (MNC) 18				◇ ◇										
(EX) Vigilant Shield 19				◇ ◇										
(EX) Global Thunder 19				◇ ◇										
(WG) Nimble Titan Year 1 20				◇ ◇ ◇ ◇										
(EX) Air and Missile Defense Exercise Series 19				△										

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		Planned Activity ◇	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇		Planned Activity ◇	
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022					
(EX) EPOCH PLANEX 20				△								
(EX) Arabian Gulf Shield (AGS) Event 1 19				△								
(EX) Global Lightning 19				◇	◇							
(EX) Fleet Synthetic Training-Joint 18				△								
(EX) Eagle Resolve 19				△								
(EX) European Air & Missile Defense Exercise Alliance 18				△								
(EX) Fleet Synthetic Training-Joint 19				△								
(EX) Arabian Gulf Shield (AGS) Event 2 19				△								
(EX) Key Resolve 19				△								
(EX) European Test Bed 19				△								
(EX) Joint Project Optic Windwill 2019				◇	◇							
(EX) Steadfast Armour 19				◇	◇							
(EX) Joint Live, Virtual, and Constructive 2019				◇	◇	◇	◇					
(EX) Austere Challenge 19				◇	◇	◇	◇	◇	◇			
(WG) Huntsville Wargames 19				△								
(EX) KEEN Sword 19				◇	◇	◇						
(WG) Demonstration, Table-top Exercises & Experiments 19				◇	◇	◇						
(EX) KEEN Edge 20				◇	◇	◇	◇					
(EX) Joint Air Defense Exercise Series 19						△						
(EX) Arabian Gulf Shield (AGS) Event 3 19						△						
(EX) Pacific Sentry 19						△						
(EX) Ulchi Freedom Guardian 19						△						
(WG) Space & Missile Defense Symposium 19						△						
(WG) Multi-National Missile Defense Conference (MNC) 19						◇	◇					

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

Significant Event Complete ▲ Significant Event Planned △	Milestone Decision Complete ★ Milestone Decision Planned ☆	Element Test Complete ◆ Element Test Planned ◇	System Level Test Complete ● System Level Test Planned ○		Complete Activity ◆ Planned Activity ◇											
			FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022							
(EX) Vigilant Shield 20						◇	◇									
(EX) Global Thunder 20						◇	◇									
(WG) Nimble Titan Year 2 20						◇	◇	◇	◇							
(EX) EPOCH PLANEX 21							◇									
(EX) Air and Missile Defense Exercise Series 20							△									
(EX) Arabian Gulf Shield (AGS) Event 1 20							△									
(EX) Global Lightning 20							◇	◇								
(EX) European Air & Missile Defense Exercise Alliance 19								△								
(EX) Fleet Synthetic Training-Joint 20								△								
(EX) Arabian Gulf Shield (AGS) Event 2 20								△								
(EX) Global Response Exercise (GREx) 19								△								
(EX) Key Resolve 20								△								
(EX) European Test Bed 20								△								
(EX) Steadfast Alliance 20								◇	◇							
(EX) Joint Live, Virtual, and Constructive 2020								◇	◇	◇	◇					
(EX) Host Nation 20									△							
(WG) Demonstration, Table-top Exercises & Experiments 20									◇	◇	◇					
(EX) KEEN Sword 21									◇	◇	◇	◇				
(EX) KEEN Sword 23									◇	◇	◇	◇				
(WG) BMDS Wargames 21									◇	◇	◇	◇	◇			
(EX) Arabian Gulf Shield (AGS) Event 3 20										△						
(EX) Pacific Sentry 20										△						
(EX) Ulchi Freedom Guardian 20										△						
(WG) Multi-National Missile Defense Conference (MNC) 20										◇	◇					

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
(EX) Vigilant Shield 21										◇	◇			
(EX) Global Thunder 21										◇	◇			
(WG) Nimble Titan Year 1 22										◇	◇	◇	◇	
(WG) Nimble Titan Year 2 22										◇	◇	◇	◇	
(EX) EPOCH PLANEX 22											△			
(EX) Joint Air Defense Exercise Series 20											△			
(EX) Air and Missile Defense Exercise Series 21											△			
(EX) Arabian Gulf Shield (AGS) Event 1 21											△			
(EX) Global Lightning 21											◇	◇		
(EX) Global Lightning 22											◇	◇		
(EX) European Air & Missile Defense Exercise Alliance 20											△			
(EX) Eagle Resolve 21											△			
(EX) Arabian Gulf Shield (AGS) Event 2 21											△			
(EX) Fleet Synthetic Training-Joint 21											△			
(EX) Key Resolve 21											△			
(EX) European Test Bed 21											△			
(EX) Joint Project Optic Windwill 2021											◇	◇		
(EX) Steadfast Armour 21											◇	◇		
(EX) Joint Live, Virtual, and Constructive 2021											◇	◇	◇	◇
(EX) Austere Challenge 21											◇	◇	◇	◇
(WG) Huntsville Wargames 21											△			
(WG) Demonstration, Table-top Exercises & Experiments 21											◇	◇	◇	
(WG) Demonstration, Table-top Exercises & Experiments 22											◇	◇	◇	
(EX) KEEN Edge 22											◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
(EX) Pacific Sentry 21												△		
(EX) Arabian Gulf Shield (AGS) Event 3 21												△		
(EX) Ulchi Freedom Guardian 21												△		
(WG) Space & Missile Defense Symposium 21												△		
(EX) Eagle Resolve 23												△		
(EX) Pacific Sentry 22												△		
(WG) Multi-National Missile Defense Conference (MNC) 21												◇	◇	
(EX) Global Thunder 22												◇	◇	
(EX) Vigilant Shield 22												◇	◇	
(WG) Multi-National Missile Defense Conference (MNC) 22												◇	◇	
(EX) Joint Air Defense Exercise Series 21													△	
(EX) Air and Missile Defense Exercise Series 22													△	
(EX) Arabian Gulf Shield (AGS) Event 1 22													△	
(EX) Joint Air Defense Exercise Series 22													△	
(EX) European Air & Missile Defense Exercise Alliance 21														△
(EX) Global Response Exercise 20														◇
(EX) European Test Bed 22														△
(EX) Arabian Gulf Shield (AGS) Event 2 22														△
(EX) Fleet Synthetic Training-Joint 22														△
(EX) Key Resolve 22														△
(EX) Steadfast Alliance 22														◇
(EX) Joint Live, Virtual, and Constructive 2022														◇
(EX) Host Nation 22														◇
(WG) BMDS Wargames 23														◇

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
(EX) Arabian Gulf Shield (AGS) Event 3 22														△
(EX) Ulchi Freedom Guardian 22														△
(EX) Global Thunder 23														◇
(EX) Vigilant Shield 23														◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) Air and Missile Defense Exercise Series 16	1	2016	1	2016
(WG) Demonstration, Table-top Exercises & Experiments 15	1	2016	1	2016
(EX) Vigilant Shield/Global Thunder 16	1	2016	1	2016
(EX) Arabian Gulf Shield (AGS) Event 1 16	1	2016	1	2016
(EX) KEEN Edge 16	1	2016	2	2016
(EX) Host Nation 16	1	2016	2	2016
(WG) Nimble Titan Year 2 16	1	2016	4	2016
(EX) Fleet Synthetic Training-Joint 16	2	2016	2	2016
(EX) Key Resolve 16	2	2016	2	2016
(EX) Arabian Gulf Shield (AGS) Event 2 16	2	2016	2	2016
(EX) Steadfast Alliance 16	2	2016	3	2016
(WG) Demonstration, Table-top Exercises & Experiments 16	3	2016	1	2017
(EX) Joint Air Defense Exercise Series 16	4	2016	4	2016
(EX) Pacific Sentry 16	4	2016	4	2016
(EX) Arabian Gulf Shield (AGS) Event 3 16	4	2016	4	2016
(EX) Ulchi Freedom Guardian 16	4	2016	4	2016
(WG) Space & Missile Defense Symposium 16	4	2016	4	2016
(WG) BMDS Wargames 17	4	2016	3	2017
(WG) Nimble Titan Year 1 18	4	2016	3	2017
(EX) Air and Missile Defense Exercise Series 17	1	2017	1	2017
(EX) EPOCH PLANEX 18	1	2017	1	2017
(EX) Arabian Gulf Shield (AGS) Event 1 17	1	2017	1	2017

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) Global Response Exercise (GREx) 17	1	2017	1	2017
(EX) European Test Bed 16-1	1	2017	1	2017
(EX) Global Lightning 17	1	2017	2	2017
(EX) Austere Challenge 17	1	2017	3	2018
(EX) Fleet Synthetic Training-Joint 17	2	2017	2	2017
(EX) Eagle Resolve 17	2	2017	2	2017
(EX) European Air & Missile Defense Exercise Alliance 16	2	2017	2	2017
(EX) Arabian Gulf Shield (AGS) Event 2 17	2	2017	2	2017
(EX) Key Resolve 17	2	2017	2	2017
(EX) European Test Bed 17	2	2017	2	2017
(EX) Steadfast Alliance 17	2	2017	3	2017
(EX) Joint Project Optic Windwill 2017	2	2017	3	2017
(EX) Steadfast Armour 17	2	2017	3	2017
(EX) Joint Live, Virtual, and Constructive 2017	2	2017	1	2018
(WG) Huntsville Wargames 17	3	2017	3	2017
(EX) KEEN Sword 17	3	2017	1	2018
(WG) Demonstration, Table-top Exercises & Experiments 17	3	2017	1	2018
(EX) KEEN Edge 18	3	2017	2	2018
(EX) Joint Air Defense Exercise Series 17	4	2017	4	2017
(EX) Arabian Gulf Shield (AGS) Event 3 17	4	2017	4	2017
(EX) Pacific Sentry 17	4	2017	4	2017
(EX) Ulchi Freedom Guardian 17	4	2017	4	2017
(WG) Space & Missile Defense Symposium 17	4	2017	4	2017
(WG) Multi-National Missile Defense Conference (MNC) 17	4	2017	1	2018
(EX) Vigilant Shield 18	4	2017	1	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) Global Thunder 18	4	2017	1	2018
(WG) Nimble Titan Year 2 18	4	2017	3	2018
(EX) Air and Missile Defense Exercise Series 18	1	2018	1	2018
(EX) EPOCH PLANEX 19	1	2018	1	2018
(EX) Arabian Gulf Shield (AGS) Event 1 18	1	2018	1	2018
(EX) Host Nation 18	1	2018	2	2018
(EX) Global Lightning 18	1	2018	2	2018
(EX) European Air & Missile Defense Exercise Alliance 17	2	2018	2	2018
(EX) Arabian Gulf Shield (AGS) Event 2 18	2	2018	2	2018
(EX) Key Resolve 18	2	2018	2	2018
(EX) European Test Bed 18	2	2018	2	2018
(EX) Global Response Exercise (GREx) 18	2	2018	3	2018
(EX) Steadfast Alliance 18	2	2018	3	2018
(EX) Joint Live, Virtual, and Constructive 2018	2	2018	1	2019
(WG) Demonstration, Table-top Exercises & Experiments 18	3	2018	1	2019
(WG) BMDS Wargames 19	3	2018	3	2019
(EX) Joint Air Defense Exercise Series 18	4	2018	4	2018
(EX) Arabian Gulf Shield (AGS) Event 3 18	4	2018	4	2018
(EX) Pacific Sentry 18	4	2018	4	2018
(EX) Ulchi Freedom Guardian 18	4	2018	4	2018
(WG) Multi-National Missile Defense Conference (MNC) 18	4	2018	1	2019
(EX) Vigilant Shield 19	4	2018	1	2019
(EX) Global Thunder 19	4	2018	1	2019
(WG) Nimble Titan Year 1 20	4	2018	3	2019
(EX) Air and Missile Defense Exercise Series 19	1	2019	1	2019

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) EPOCH PLANEX 20	1	2019	1	2019
(EX) Arabian Gulf Shield (AGS) Event 1 19	1	2019	1	2019
(EX) Global Lightning 19	1	2019	2	2019
(EX) Fleet Synthetic Training-Joint 18	2	2019	2	2019
(EX) Eagle Resolve 19	2	2019	2	2019
(EX) European Air & Missile Defense Exercise Alliance 18	2	2019	2	2019
(EX) Fleet Synthetic Training-Joint 19	2	2019	2	2019
(EX) Arabian Gulf Shield (AGS) Event 2 19	2	2019	2	2019
(EX) Key Resolve 19	2	2019	2	2019
(EX) European Test Bed 19	2	2019	2	2019
(EX) Joint Project Optic Windwill 2019	2	2019	3	2019
(EX) Steadfast Armour 19	2	2019	3	2019
(EX) Joint Live, Virtual, and Constructive 2019	2	2019	1	2020
(EX) Austere Challenge 19	2	2019	3	2020
(WG) Huntsville Wargames 19	3	2019	3	2019
(EX) KEEN Sword 19	3	2019	1	2020
(WG) Demonstration, Table-top Exercises & Experiments 19	3	2019	1	2020
(EX) KEEN Edge 20	3	2019	2	2020
(EX) Joint Air Defense Exercise Series 19	4	2019	4	2019
(EX) Arabian Gulf Shield (AGS) Event 3 19	4	2019	4	2019
(EX) Pacific Sentry 19	4	2019	4	2019
(EX) Ulchi Freedom Guardian 19	4	2019	4	2019
(WG) Space & Missile Defense Symposium 19	4	2019	4	2019
(WG) Multi-National Missile Defense Conference (MNC) 19	4	2019	1	2020
(EX) Vigilant Shield 20	4	2019	1	2020

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) Global Thunder 20	4	2019	1	2020
(WG) Nimble Titan Year 2 20	4	2019	3	2020
(EX) EPOCH PLANEX 21	1	2020	1	2020
(EX) Air and Missile Defense Exercise Series 20	1	2020	1	2020
(EX) Arabian Gulf Shield (AGS) Event 1 20	1	2020	1	2020
(EX) Global Lightning 20	1	2020	2	2020
(EX) European Air & Missile Defense Exercise Alliance 19	2	2020	2	2020
(EX) Fleet Synthetic Training-Joint 20	2	2020	2	2020
(EX) Arabian Gulf Shield (AGS) Event 2 20	2	2020	2	2020
(EX) Global Response Exercise (GREx) 19	2	2020	2	2020
(EX) Key Resolve 20	2	2020	2	2020
(EX) European Test Bed 20	2	2020	2	2020
(EX) Steadfast Alliance 20	2	2020	3	2020
(EX) Joint Live, Virtual, and Constructive 2020	2	2020	1	2021
(EX) Host Nation 20	3	2020	3	2020
(WG) Demonstration, Table-top Exercises & Experiments 20	3	2020	1	2021
(EX) KEEN Sword 21	3	2020	2	2021
(EX) KEEN Sword 23	3	2020	2	2021
(WG) BMDS Wargames 21	3	2020	3	2021
(EX) Arabian Gulf Shield (AGS) Event 3 20	4	2020	4	2020
(EX) Pacific Sentry 20	4	2020	4	2020
(EX) Ulchi Freedom Guardian 20	4	2020	4	2020
(WG) Multi-National Missile Defense Conference (MNC) 20	4	2020	1	2021
(EX) Vigilant Shield 21	4	2020	1	2021
(EX) Global Thunder 21	4	2020	1	2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
(WG) Nimble Titan Year 1 22	4	2020	3	2021
(WG) Nimble Titan Year 2 22	4	2020	3	2021
(EX) EPOCH PLANEX 22	1	2021	1	2021
(EX) Joint Air Defense Exercise Series 20	1	2021	1	2021
(EX) Air and Missile Defense Exercise Series 21	1	2021	1	2021
(EX) Arabian Gulf Shield (AGS) Event 1 21	1	2021	1	2021
(EX) Global Lightning 21	1	2021	2	2021
(EX) Global Lightning 22	1	2021	2	2021
(EX) European Air & Missile Defense Exercise Alliance 20	2	2021	2	2021
(EX) Eagle Resolve 21	2	2021	2	2021
(EX) Arabian Gulf Shield (AGS) Event 2 21	2	2021	2	2021
(EX) Fleet Synthetic Training-Joint 21	2	2021	2	2021
(EX) Key Resolve 21	2	2021	2	2021
(EX) European Test Bed 21	2	2021	2	2021
(EX) Joint Project Optic Windwill 2021	2	2021	3	2021
(EX) Steadfast Armour 21	2	2021	3	2021
(EX) Joint Live, Virtual, and Constructive 2021	2	2021	1	2022
(EX) Austere Challenge 21	2	2021	3	2022
(WG) Huntsville Wargames 21	3	2021	3	2021
(WG) Demonstration, Table-top Exercises & Experiments 21	3	2021	1	2022
(WG) Demonstration, Table-top Exercises & Experiments 22	3	2021	1	2022
(EX) KEEN Edge 22	3	2021	2	2022
(EX) Pacific Sentry 21	4	2021	4	2021
(EX) Arabian Gulf Shield (AGS) Event 3 21	4	2021	4	2021
(EX) Ulchi Freedom Guardian 21	4	2021	4	2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MT03 / <i>Joint Warfighter Support Test</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
(WG) Space & Missile Defense Symposium 21	4	2021	4	2021
(EX) Eagle Resolve 23	4	2021	4	2021
(EX) Pacific Sentry 22	4	2021	4	2021
(WG) Multi-National Missile Defense Conference (MNC) 21	4	2021	1	2022
(EX) Global Thunder 22	4	2021	1	2022
(EX) Vigilant Shield 22	4	2021	1	2022
(WG) Multi-National Missile Defense Conference (MNC) 22	4	2021	1	2022
(EX) Joint Air Defense Exercise Series 21	1	2022	1	2022
(EX) Air and Missile Defense Exercise Series 22	1	2022	1	2022
(EX) Arabian Gulf Shield (AGS) Event 1 22	1	2022	1	2022
(EX) Joint Air Defense Exercise Series 22	1	2022	1	2022
(EX) European Air & Missile Defense Exercise Alliance 21	2	2022	2	2022
(EX) Global Response Exercise 20	2	2022	2	2022
(EX) European Test Bed 22	2	2022	2	2022
(EX) Arabian Gulf Shield (AGS) Event 2 22	2	2022	2	2022
(EX) Fleet Synthetic Training-Joint 22	2	2022	2	2022
(EX) Key Resolve 22	2	2022	2	2022
(EX) Steadfast Alliance 22	2	2022	3	2022
(EX) Joint Live, Virtual, and Constructive 2022	2	2022	1	2023
(EX) Host Nation 22	3	2022	3	2022
(WG) BMDS Wargames 23	3	2022	3	2023
(EX) Arabian Gulf Shield (AGS) Event 3 22	4	2022	4	2022
(EX) Ulchi Freedom Guardian 22	4	2022	4	2022
(EX) Global Thunder 23	4	2022	1	2023
(EX) Vigilant Shield 23	4	2022	1	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MC03 / <i>Cyber Operations</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC03: <i>Cyber Operations</i>	-	0.000	0.000	0.152	-	0.152	0.155	0.157	0.160	0.162	0	0.786
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project MC03 is the Defensive Cyber Operations Project established in this Program Element (PE) during PBR 2018. Funds were previously reported in Project MD03 of this PE.

A. Mission Description and Budget Item Justification

The funds in this project are required to verify and validate that cybersecurity and/or cybersecurity-enabled products (firewalls, data/network encryption devices, routers, Intrusion Detection Systems, etc.) used within the MDA infrastructure have a current and Evaluated Assurance Level (EAL) certification and rating. They assure that validated IT products are listed on the DOD Approved Products List (APLITS). There is an additional requirement to routinely identify findings and prepare a report with recommendations. The Warfighter Strategic Integration directorate (DDW) requires this support in the IT product evaluation provided. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Strategic Warfighter Integration Software Assurance Support	0.000	0.000	0.152
Articles:	-	-	-
Description: Perform manual and automated software code analysis, using GFE tools (e.g. Fortify 360), to detect false positives, weaknesses, and vulnerabilities. 1) Verify and validate cybersecurity and/or cybersecurity-enabled products (firewalls, data/network encryptors, routers, Intrusion Detection Systems, etc.) used within the MDA infrastructure have a current and Evaluated Assurance Level (EAL) certification and rating. Validate IT products are listed on the DoD Approved Products List (APLITS). 2) Participate in meetings with customers to review software analysis findings and proposed courses of action for remediation. 3) Prepare a comprehensive report detailing the weaknesses and vulnerabilities found. Document the references to files and line numbers. 4) Maintain a record of all software code analysis documentation and organized in accordance with Government policy.			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MC03 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
See Description			
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.152

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency											Date: May 2017			
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>					Project (Number/Name) MC03 / <i>Cyber Operations</i>				

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Strategic Warfighter Integration Software Assurance Support - DDW Software Assurance Support	C/CPFF	TEAMS : COS	0.000	0.000		0.000		0.152	Mar 2018	-		0.152	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		0.152		-		0.152	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	0.152	-	0.152	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017									
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>				Project (Number/Name) MC03 / <i>Cyber Operations</i>							
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇						
MC03 Cyber Operations				FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022					
						◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MC03 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC03 Cyber Operations	1	2018	1	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	9.113	2.180	1.936	2.202	-	2.202	2.392	2.450	2.591	2.619	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 In FY 2016, FY 2017, and FY 2018 Program Wide Support reflects proportional changes in Ballistic Missile Defense Joint Warfighter Support. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	2.180	1.936	2.202
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	2.180	1.936	2.202

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance (MIPR)	MIPR	Various : Multi: AK, AL, CA, CO, VA	1.200	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various Multi: AL, CO, CA, VA : Various	0.663	0.145		0.039	Jul 2017	0.044	Jul 2018	-		0.044	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	MDA : Multi:AK,AL, CA, CO, VA	1.504	1.102	Nov 2015	1.464	Nov 2016	1.300	Nov 2017	-		1.300	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	ALATEC , INC. : AL, CO, VA	5.489	0.933	Oct 2015	0.433	Aug 2017	0.461	Aug 2018	-		0.461	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Various : Multi:AK, AL, CA, CO, VA	0.000	0.000		0.000		0.397	Aug 2018	-		0.397	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support, International, and Materiel and Readiness	MIPR	Naval Surface Warfare Center; VA, AL : Various	0.257	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	C/CPAF	Various : Multi: AL, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			9.113	2.180		1.936		2.202		-		2.202	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.113	2.180	1.936	2.202	-	2.202	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017													
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>						Project (Number/Name) MD40 / <i>Program-Wide Support</i>							
Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇	
						FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
MD40 Program-Wide Support						◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / <i>Ballistic Missile Defense Joint Warfighter Support</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603904C / Missile Defense Integration and Operations Center (MDIOC)
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	323.288	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
MD22: Missile Defense Integration and Operations Center (MDIOC)	310.369	43.587	51.773	50.261	-	50.261	51.261	54.269	55.090	56.210	Continuing	Continuing
MC22: Cyber Operations	1.106	0.462	0.456	0.612	-	0.612	0.617	0.640	0.653	0.666	Continuing	Continuing
MD40: Program-Wide Support	11.813	2.142	2.521	2.392	-	2.392	2.627	2.679	2.831	2.862	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

In FY 2017, the Missile Defense Integration and Operations Center increase is for critical end-of-life infrastructure components.

A. Mission Description and Budget Item Justification

The Missile Defense Integration and Operations Center (MDIOC) is the Missile Defense Agency's (MDA) field operating activity in Colorado Springs, Colorado. It provides the necessary infrastructure and support services through a mission execution platform for MDA elements/components and designated Combatant Commanders' Ballistic Missile Defense System (BMDS) operations executing missions at the MDIOC. The Integration Center is the organization responsible for providing a single, integrated set of skilled personnel matrixed from across MDA to manage this mission. The MDIOC mission facilities consist of a highly secure research and development complex and a mission support module (area) located at Schriever Air Force Base, adjacent to North American Aerospace Defense Command (NORAD) and United States Northern Command (USNORTHCOM). The MDA Integration Center provides mission critical system technical capabilities and subject matter expertise in a dedicated and adaptable environment that enables developers, testers, and operators to evolve, assess and deliver the capabilities for layered missile defense execution for homeland defense and theater/regional support. The MDIOC interfaces with the Information Technology/Information Assurance Enterprise to provide high availability access to worldwide secure communications, network health and status monitoring, mission critical restoral capability, and technical expertise for all MDA directed activities and events. The MDIOC functions as the mission control for BMDS distributed ground tests and system wide flight tests enabling the mission and test directors to control both main and associated test operations using secure voice, test, and mission network hubs from the MDIOC. The MDIOC also functions as the only system-level integration and interoperability mission execution platform for BMDS fire control; and it provides the physical interface between the developers and the Combatant Command warfighters.

MDIOC mission facilities contribute to the BMDS by directly supporting the concept of Concurrent Test, Training, and Operations (CTTO) for the BMDS by providing engineering integration, resource scheduling, configuration management, and implementation development support for MDA and BMDS-level test, training, and operational mission execution.

MDIOC Major Program Goals:

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>
---	--

- Provide the capabilities and services necessary to support engineering integration, resource scheduling for ground and flight tests, configuration management, and implementation development support of on-site activities
- Ensure around the clock support and restoral of designated BMDS operational activities
- Improve interface with designated Combatant Command missile defense activities; host/support the headquarters and operations center for United States Strategic Command
- Joint Functional Component Command - Integrated Missile Defense
- Continue to achieve cost effectiveness and efficiencies by leveraging existing Missile Defense Integration and Operations Center infrastructure, services, processes, and expertise to support assigned missions
- Maintain and improve the reliability, availability, and maintainability of MDIOC mission critical systems

Program-Wide Support (PWS) consists of essential non-headquarters management efforts providing integrated and efficient support to MDA functions and activities across the entire BMDS.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	47.939	54.750	53.894	-	53.894
Current President's Budget	46.191	54.750	53.265	-	53.265
Total Adjustments	-1.748	0.000	-0.629	-	-0.629
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.703	0.000			
• SBIR/STTR Transfer	-1.045	0.000			
• Other Adjustment	0.000	0.000	-0.629	-	-0.629

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603904C / Missile Defense Integration and Operations Center (MDIOC)				Project (Number/Name) MD22 / Missile Defense Integration and Operations Center (MDIOC)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD22: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	310.369	43.587	51.773	50.261	-	50.261	51.261	54.269	55.090	56.210	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2017, the Missile Defense Integration and Operations Center increase is a result of planning for projects deferred in FY 2016 and critical end-of-life infrastructure components.

A. Mission Description and Budget Item Justification

The Missile Defense Integration and Operations Center (MDIOC) sustains and operates a 24 hours a day, 365 days a year mission complex for critical research, development, testing, training, and operations for BMDS activities. The MDIOC supports the Ground-based Midcourse Missile Defense Mission Control Center Facility, as well as the Command, Control, Battle Management, and Communications (C2BMC) Integration and Test Centers and the C2BMC Experimentation Laboratories. It provides infrastructure support for the Satellite Tracking and Surveillance System's (STSS) Missile Defense Space Center (MDSC); and the Targets and Countermeasures' (TC) Joint Target Operations Center (JTOC). The MDIOC also provides developmental support to the Enterprise Sensors Laboratory (ESL) composed of a common satellite ground station and sensor netting test bed for designated Ballistic Missile Defense System (BMDS) elements. The MDIOC supports BMDS test events based on the Integrated Master Test Plan (IMTP.) It supports BMDS Critical Engagement Conditions testing and analysis through the operation of the Test Execution Control node for distributed BMDS ground tests. During system flight tests, the MDIOC provides infrastructure (power, Heating, Ventilation and Air Conditioning, and communications) support to the Flight Test Director and crew, and ensures the protection of facility and test assets throughout the test window. Further, the MDIOC provides the facilities that support operations of the Missile Defense Element, manned by the U.S. Army 100th Missile Defense Brigade, the United States Northern Command (USNORTHCOM) C2BMC Command and Control Center (CCC), the United States Strategic Command's (USSTRATCOM's) Joint Functional Component Command-Integrated Missile Defense (JFCC-IMD) and the Missile Defense Agency (MDA) Warfighter Support Center. In addition, the MDIOC supports the MDA Operations Support Center, which provides situational awareness of the health and status of the end-to-end BMDS, and provides network subject matter expertise and technical reach back for the program elements and Combatant Commanders. The MDIOC hosts BMDS wargames and exercises in support of the warfighter, and delivers requisite infrastructure to integrate the modeling and simulation assets that form system-level constructive simulations for full-envelope BMDS performance assessment, with surrogate capability for BMDS ground tests. The MDIOC maintains a technical repository of BMDS Implementation Architectures for real-time operations and configuration control; provides state change management and asset management technical support for the BMDS; and provides the technical environment for BMDS Watch Officers, Safety Officers, and Information Assurance Officers to perform their assigned duties. The MDIOC also supports the operations of the Joint Early Warning Laboratory (JEWL), which provides USSTRATCOM with quick response analyses of real-world launches, and rapid anomaly identification and resolution.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Infrastructure Systems and Support	18.233	20.880	20.656

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p align="right"><i>Articles:</i></p> <p>Description: RECURRING:</p> <p>MDIOC Communications and Special Purpose Processing Node (SPPN):</p> <ul style="list-style-type: none"> - Establish a DoD compliant capable of meeting the unique network and data center services required to develop and deploy a layered BMDS to defend the United States. - Provide distinctive specifications and provisioning requirements associated with the MDA Research, Development, Test and Evaluation (RDT&E) Mission. - Provide capabilities that dynamically interconnect and integrate multiple RDT&E systems to large data sets and enable collaboration in near real-time with National Research Laboratories and Test Ranges; and Defense Industrial Base industry partners throughout the BMDS acquisition lifecycle. - Construct the SPPN infrastructure with routers, switches, firewalls, and intrusion detection systems that provide IT support to over 10,500 MDA classified/unclassified users worldwide. - Provide network operations and network monitoring; development of detailed solutions, designs, and plans; Disaster Recovery and Continuity of Operations rehearsals; internet access management; and web filtering. - Sustain core communications distribution services across the MDA Enterprise. - Plan, engineer, and implement sustainment projects for general IT services and business systems consistent with the IT architecture roadmap. - Acquire and distribute mission critical unclassified and secure communication capability to resident MDA elements/components and BMDS and Warfighter operational elements. - Provide computer hosting of specified threat models and support the integration of other threat tools as required. <p>End User Support:</p> <ul style="list-style-type: none"> - Sustain End User core service support 18 hours a day, 6 days a week for administrative and business information systems for unclassified and classified users - Monitor networks for user compliance with DoD policies and report incidents - Maintain Printing and Copy Services 	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Sustain email services (Exchange servers, BlackBerry Enterprise Services servers and archiving storage area networks) - Sustain file services (file servers and storage area networks) - Maintain Directory Services (Active Directory and domain controller servers) - Maintain Authentication services (Public Key Infrastructure/Common Access Card) - Maintain current hardware and software licenses for IT operational systems - Maintain an Integrated Service Desk - Maintain IT life-cycle asset management of end user devices (desktops, laptops, monitors, printers, thin clients, and BlackBerrys) <p>Hardware and Software Asset Management:</p> <ul style="list-style-type: none"> - Manage government property and IT hardware and software in accordance with the Federal Acquisition Regulations (FAR)/DoD FAR Supplements (DFARs) to include accountability, reporting, warehouse management, asset transportation and excess asset management - Maintain an inventory of IT hardware and software assets connected or used in the ULAN, CLAN, SIPRNET and TS/SCI networks <p>Cable Plant Cubicle Workstation:</p> <ul style="list-style-type: none"> - Install facility connectivity cabling; provide trouble-shooting and repair - Install and reconfigure furniture and workstations <p>Infrastructure Implementation Engineering:</p> <ul style="list-style-type: none"> - Implement intelligence hardware/software updates as required to support the Operations Support Center - Provide MDIOC centric test event network related detailed designs in support of Test Events and real world operational events, provide implementation plans, update interface control documents and perform Change Control and Configuration Management services - Plan, design, test and operate the IT and communications technical architecture including Internet Protocol addressing schema, routing tables, switching policies, data paths, information assurance controls, fire wall configurations, application configurations, band width allocations for sub networks and eventual post event return to base line - Provide technical health and status monitoring, troubleshooting, and break/fix, IT/Communications support 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017			
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018	
<p>for each of the event architectures including critical asset identification, monitoring, Quality Assurance/Quality Control (QA/QC) seals with configuration management and job control</p> <ul style="list-style-type: none"> - Implement final Defense Information Systems Agency - Global Information Grid (DISA GIG) Mission Assurance node configuration <p>Specific and/or unique accomplishments to a FY are as follows:</p> <p>FY 2016 Accomplishments: See Above</p> <p>FY 2017 Plans: The increase from FY 2016 to FY 2017 is to support the increase in cyber protection requirements</p> <p>FY 2018 Plans: See Above</p>					
<p>Title: Facilities and Maintenance</p> <p>Description: RECURRING:</p> <p>Host Tenant Support(Electrical, Gas, Sewer, Water, Steam, Chilled Water, Waste Water, Landscaping, Refuse Removal, and Communications Support):</p> <ul style="list-style-type: none"> - Procure utility services through 50th Air Force Space Wing (Host Base) - Sustain utility infrastructure and delivery systems <p>Environmental, Safety and Occupational Health (ESOH):</p> <ul style="list-style-type: none"> - Maintain and updated the program accident prevention plan - Provide required industrial safety training to facility services personnel - Procure and distributed personal protection equipment for contracted activities - Ensure compliance with Hazardous Waste, Hazardous Material Recycling, and National Environmental Policy Act (NEPA) programs - Conduct recurring safety and environmental audits 		Articles:	13.101 -	14.935 -	14.708 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>
--	--	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<p>Facilities Operations and Sustainment:</p> <ul style="list-style-type: none"> - Provide 24 hours a day, 365 days a year, facility maintenance break/fix response for all facility systems (electrical; Heating, Ventilation, and Air Conditioning; plumbing; locksmith) with a response time of 15 minutes after normal duty hours - Conduct preventative maintenance inspections (PMIs) for all building systems <p>Facilities Engineering:</p> <ul style="list-style-type: none"> - Conduct Management Process Facility Installation Standard Audits - Provide risk management analysis and mitigation plans - Maintain infrastructure drawings configuration management databases on a limited basis - Develop and document facility long range planning programming - Provide consulting services, preliminary designs and engineering rough order of magnitude estimates for required infrastructure buildout changes <p>Missile Defense Integration and Operations Center (MDIOC) Operating Expenses:</p> <ul style="list-style-type: none"> - Lease General Services Administration (GSA) vehicles and a commercial warehouse - Fund calibration of measuring and monitoring equipment - Fund repair of classified network switches <p>Facility Services:</p> <ul style="list-style-type: none"> - Provide custodial services for over 675,000 square feet of floor space in Buildings 720 and 730 - Provide limited Copy Center and Shuttle Services for over 2,000 personnel - Provide in/out processing and personnel moves <p>Specific and/or unique accomplishments to a FY are as follows:</p> <p>FY 2016 Accomplishments: See Above</p> <p>FY 2017 Plans:</p>			
---	--	--	--

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
The increase from FY 2016 to FY 2017 is a result of increased cost for host tenant support and increased rigor of configuration management documentation				
FY 2018 Plans: See Above				
Title: Engineering and Event Services		7.337	7.202	7.215
Description: RECURRING: Mission Assurance and Event Execution Support		Articles: -	-	-
<ul style="list-style-type: none"> - Implement baseline technical control for all Missile Defense Integration and Operations Center (MDIOC) mission critical subsystems and services - Execute MDIOC engineering management, quality assurance, configuration management and integration of all mission critical systems including: <ul style="list-style-type: none"> - Technical power distribution, Uninterruptable Power Supply Systems, major transformer substations, and circuit protection - Heating, Ventilation and Air Conditioning, chilled water and steam systems - Secure and non-secure voice communications for Ballistic Missile Defense Systems (BMDS); Operations, major tests, and general constituencies - Local and wide area secure data networking environments and network health and status tools 24 hours a day, 365 days a year - Ensure high availability of integrated MDIOC systems and BMDS Operations support 24 hours a day, 365 days a year - Implement 'last mile' integration for BMDS Operations, BMDS tests, wargames, exercises, training, and general admin services - Execute comprehensive configuration baseline integrity periods of non-disruption, periods of interest and work screening for all major tests and real world contingencies - Coordinate MDIOC process improvement investments across all mission areas - Execute aggressive, proactive and tailored risk management to ensure integrity and persistent connectivity and infrastructure support for all MDA missions executed from the MDIOC Mission Execution Platform to include BMDS system flight and ground test, space layer missile defense operations, modeling and simulation, wargames and exercises, and operations support to both MDA and Combatant Command operations work centers. 				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>Technical Watch Support</p> <p>Provide on-site technical environment for BMDS Watch Officers, Safety Officers, and Information Assurance Officers to execute their duties 24 hours a day, 365 days a year to include coordinating, reporting, and escalating critical information and BMDS test and operation event information to all MDIOC technical and management staff to ensure rapid break/fix actions are executed.</p> <p>Program Quality Management, Risk Management, and Earned Value Management</p> <p>Provide engineering coordination, resource management, and integration of the dynamic spectrum of events across all MDIOC mission areas to include oversight of quality management, risk management, and earned value management.</p> <p>Event Architecture and Engineering Design:</p> <p>Coordinate design and implementation of technical architectures for all major MDIOC hosted BMDS tests, training and operations to include updating BMDS end-to-end Combatant Command deployed architecture as-built documentation reflecting new incremental content and deployments, and maintaining a technical repository of BMDS Implementation Architectures for real-time operation and configuration management.</p> <p>Specific and/or unique accomplishments to a FY are as follows:</p> <p>FY 2016 Accomplishments: See Above</p> <p>FY 2017 Plans: The decrease from FY 2016 to FY 2017 of the Engineering and Event Services is a result of increasing the integration rigor to mitigate mission assurance risk critical for test events within the Engineering and Event Services.</p> <p>FY 2018 Plans: See Above</p>				
Title: Operations and Sustainment		4.916	5.899	5.682
		Articles: -	-	-
Description: RECURRING:				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017			
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018	
<ul style="list-style-type: none"> - Fund Civilian and CSS positions supporting operations and sustainment of all Missile Defense Integration and Operations Center (MDIOC) activities contributing to the mission execution platform - Provide quality event planning, coordination, logistics, security access and host support for all MDIOC events and visitors - Deliver integrated service coordination for all MDIOC event and protocol support including management of the: <ul style="list-style-type: none"> - Event Registration Web site - Offsite event registration - Security processing, including clearance verification and badging - Arrangement/Coordination/Scheduling of bus transportation - Reservation, setup, and coordination of access for all primary shared MDIOC conference rooms - Operation of Audio Visual equipment during events - Preparation for and conduct of official ceremonies; coordination and hosting of Distinguished Visitor itineraries; and information disclosure approval coordination - Fund Training and Travel <p>Specific and/or unique accomplishments to a FY are as follows:</p> <p>FY 2016 Accomplishments: See Above</p> <p>FY 2017 Plans: See Above</p> <p>FY 2018 Plans: See Above</p>					
<p>Title: Infrastructure Systems Repair, Sustainment, and Critical Upgrades</p> <p>Description: RECURRING:</p> <ul style="list-style-type: none"> - Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant) 		Articles:	0.000 -	2.857 -	2.000 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Fire Suppression System Compliance Project (two quadrants)			
<i>FY 2016 Accomplishments:</i> The decrease in FY2016 is due to the realignment of funds to other Department of Defense priorities			
<i>FY 2017 Plans:</i> The Infrastructure Systems Repair, Sustainment, and Critical Upgrades funding increase in FY 2017 is needed to accomplish scheduled Facility Sustainment, Restoration, and Modernization - Projects are listed in the R4 schedule			
<i>FY 2018 Plans:</i> The decrease from FY 2017 to FY 2018 in the Infrastructure Systems Repair, Sustainment, and Critical Upgrades aligns funding with the Missile Defense and Integration Facility Sustainment Plan and ensures the Facility maintains a Facility Condition Index that meets Department of Defense established goals. Projects are listed in the R4 schedule			
Accomplishments/Planned Programs Subtotals	43.587	51.773	50.261

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0603294C: <i>Common Kill Vehicle Technology</i>	60.851	0.000	252.879	-	252.879	321.175	110.934	0.000	0.000	Continuing	Continuing
• 0603881C: <i>Ballistic Missile</i>	197.617	209.072	230.162	-	230.162	194.328	253.778	264.377	267.254	Continuing	Continuing
Defense Terminal Defense Segment											
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>
--	--	---

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603893C: <i>Space Tracking and Surveillance System</i>	27.262	32.129	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	21.040	20.690	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603898C: <i>Ballistic Missile Defense Joint Warfighter Support</i>	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0603913C: <i>Israeli Cooperative Programs</i>	267.595	103.835	105.354	-	105.354	108.002	109.742	111.901	114.219	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Joint National Integration Center Research and Development Contract / Integrated Research and Development for Enterprise Solutions Contract is the major performing integrated contract and is scheduled to be recompleted in FY 2017. The acquisition strategy for MDIOC mission execution is to employ a contract to perform designated integration and sustainment tasks to conduct BMDS Research, Development, Test and Evaluation (RDT&E). The MDIOC is operated by missile defense subject matter experts composed of Government, military, civilian personnel, MDIOC Contract Support Services, and major defense contractors.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Infrastructure Systems and Support - MDIOC IRES/TBD	C/CPIF	MDIOC/IRES/TBD : Colorado Springs, CO	0.000	0.000		0.000		1.000	Jul 2018	-		1.000	Continuing	Continuing	Continuing
Infrastructure Systems and Support - MDIOC NG	C/CPAF	MDIOC/Northrup Grumman Mission Systems : Colorado Springs, CO	117.962	18.233	Nov 2015	20.880	Nov 2016	19.656	Jan 2018	-		19.656	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC Custodial	C/FFP	MDIOC/Ability One : Colorado Springs, CO	1.161	1.330	Dec 2015	1.158	Oct 2016	1.182	Dec 2017	-		1.182	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC GSA / Leases / Calibration	MIPR	Various (GSA, Warehouses) : Colorado Springs, CO	6.135	0.729	Nov 2015	0.617	Nov 2016	0.629	Oct 2017	-		0.629	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC IRES/TBD	C/CPIF	MDIOC/IRES : Colorado Springs, CO	0.000	0.000		0.000		1.000	Jul 2018	-		1.000	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC NG	C/CPAF	MDIOC/Northrup Grumman Mission Systems : Colorado Springs, CO	75.497	7.950	Nov 2015	10.052	Nov 2016	8.699	Nov 2017	-		8.699	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC Utilities	MIPR	50th Space Wing : Schriever AFB, CO	14.542	3.092	Oct 2015	3.108	Oct 2016	3.198	Oct 2017	-		3.198	Continuing	Continuing	Continuing
Engineering and Event Services - MDIOC NG	C/CPAF	MDIOC/Northrup Grumman Mission Systems : Colorado Springs, CO	51.731	7.337	Oct 2015	7.202	Oct 2016	7.215	Nov 2017	-		7.215	Continuing	Continuing	Continuing
Operations and Sustainment - FFRDC	FFRDC	MDIOC : Colorado Springs, CO	2.167	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operations and Sustainment - Operations & Sustainment	Allot	MDIOC : Colorado Springs, CO	18.001	2.716	Oct 2015	3.091	Oct 2016	3.000	Oct 2017	-		3.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / Missile Defense Integration and Operations Center (MDIOC)	Project (Number/Name) MD22 / Missile Defense Integration and Operations Center (MDIOC)
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Operations and Sustainment - Support Services	C/CPFF	MiDAESS/TEAMS Multi : Colorado Springs, CO	14.433	2.163	Nov 2015	2.719	Nov 2016	2.622	Nov 2017	-		2.622	Continuing	Continuing	Continuing
Operations and Sustainment - Travel and Training	Allot	MDIOC : Colorado Springs, CO	0.626	0.037	Oct 2015	0.089	Oct 2016	0.060	Nov 2017	-		0.060	Continuing	Continuing	Continuing
Infrastructure Systems Repair, Sustainment, and Critical Upgrades - MDIOC NG	C/CPAF	MDIOC/Northrop Grumman Mission Systems : Colorado Springs, CO	8.114	0.000		2.857	Dec 2016	2.000	Jan 2018	-		2.000	Continuing	Continuing	Continuing
Subtotal			310.369	43.587		51.773		50.261		-		50.261	-	-	-

Remarks
Funds for utilities and base communications are specified in the Inter-service Support Agreement with the 50th Space Wing. In addition, the Missile Defense Integration and Operations Center (MDIOC) provides Technical Contract Support Services employees, for MDIOC operations and oversight of the Joint Research and Development Contractor (JRDC), as well as funding for JRDC work as required by the government.

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	310.369	43.587	51.773	50.261	-	50.261	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>
--	--	---

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2017)					◇	◇	◇	◇																				
Replace/repair drainage/sewer system (Phase I -Building 720)					◇	◇	◇	◇																				
Re-purpose basement space to accommodate IT and Infrastructure support personnel (Phase II)					◇	◇	◇	◇																				
Fire Suppression System Compliance Project (two quadrants)(FY 2017)						◇	◇	◇																				
Replace Heating, Ventilation, and Air Conditioning (HVAC) Chilled Water Pumps (North System)						◇	◇	◇																				
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2018)									◇	◇	◇	◇																
Re-purpose basement space to accommodate IT and Infrastructure support personnel (Phase III)									◇	◇	◇	◇																
Electrical power distribution in two mission quadrants to replace- End-of-Life systems, increase reliability, improve power distribution efficiency, and redundancy to mission critical areas									◇	◇																		
Fire Suppression System Compliance Project (two quadrants)(FY 2018)									◇	◇	◇																	
Replace end-of-life Emergency Lighting Module (Building 730)									◇	◇																		
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2019)													◇	◇	◇	◇												
Re-purpose basement space to accommodate IT and Infrastructure support personnel (Phase IV)													◇	◇	◇	◇												
Replace/repair drainage/sewer system (Phase III -Building 720)													◇	◇	◇	◇												
Fire Suppression System Compliance Project (two quadrants)(FY 2019)													◇	◇	◇													
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2020)																	◇	◇	◇	◇								
Install Ambient Air Economizer (greening initiative)																	◇	◇	◇	◇								
Replace Heating, Ventilation, and Air Conditioning (HVAC) Chilled Water Pumps (North and South Loops)																	◇	◇	◇	◇								
Fire Suppression System Compliance Project (two quadrants)(FY 2020)																	◇	◇	◇									

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>
--	--	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2021)											◇	◇	◇	◇
Fire Suppression System Compliance Project (two quadrants)(FY 2021)												◇	◇	◇
Availability/Arc Flash/Short Circuit Coordination Study												◇		

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2017)	1	2017	4	2017
Replace/repair drainage/sewer system (Phase I -Building 720)	1	2017	4	2017
Re-purpose basement space to accommodate IT and Infrastructure support personnel (Phase II)	1	2017	4	2017
Fire Suppression System Compliance Project (two quadrants)(FY 2017)	2	2017	4	2017
Replace Heating, Ventilation, and Air Conditioning (HVAC) Chilled Water Pumps (North System)	2	2017	4	2017
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2018)	1	2018	4	2018
Re-purpose basement space to accommodate IT and Infrastructure support personnel (Phase III)	1	2018	4	2018
Electrical power distribution in two mission quadrants to replace- End-of-Life systems, increase reliability, improve power distribution efficiency, and redundancy to mission critical areas	2	2018	3	2018
Fire Suppression System Compliance Project (two quadrants)(FY 2018)	2	2018	4	2018
Replace end-of-life Emergency Lighting Module (Building 730)	3	2018	4	2018
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2019)	1	2019	4	2019
Re-purpose basement space to accommodate IT and Infrastructure support personnel (Phase IV)	1	2019	4	2019
Replace/repair drainage/sewer system (Phase III -Building 720)	1	2019	4	2019

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD22 / <i>Missile Defense Integration and Operations Center (MDIOC)</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
Fire Suppression System Compliance Project (two quadrants)(FY 2019)	2	2019	4	2019
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2020)	1	2020	4	2020
Install Ambient Air Economizer (greening initiative)	1	2020	4	2020
Replace Heating, Ventilation, and Air Conditioning (HVAC) Chilled Water Pumps (North and South Loops)	1	2020	4	2020
Fire Suppression System Compliance Project (two quadrants)(FY 2020)	2	2020	4	2020
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720 (one quadrant)(FY 2021)	1	2021	4	2021
Fire Suppression System Compliance Project (two quadrants)(FY 2021)	2	2021	4	2021
Availability/Arc Flash/Short Circuit Coordination Study	3	2021	3	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MC22 / <i>Cyber Operations</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC22: <i>Cyber Operations</i>	1.106	0.462	0.456	0.612	-	0.612	0.617	0.640	0.653	0.666	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The Missile Defense Integration and Operations Center (MDIOC) conducts Cyber Defensive Operations through Key Management Infrastructure and Information Assurance Training which interfaces with the Information Technology/Information Assurance Enterprise to provide secure communications, network health and status monitoring, mission critical restoral capability, and technical expertise.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Cyber Defensive Operations	0.462	0.456	0.612
Articles:	-	-	-
Description: RECURRING: The Missile Defense Integration and Operations Center (MDIOC) conducts Defensive Cyber Operations in the following categories:			
Key Management Infrastructure - Interface with the Information Technology/Information Assurance Enterprise to provide for the generation, production, control and distribution, and training for utilizing the keying material used with the Agency's cryptographic devices.			
Information Assurance Training - Maintain an Information Assurance (IA) certified workforce through continuous IA training as required by DoD Directive 8570			
Specific and/or unique accomplishments to a FY are as follows:			
FY 2016 Accomplishments: See Above			
FY 2017 Plans: See Above			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MC22 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
See Above. The increase from FY 2017 to FY 2018 in the Cyber Operations is due to the increase in mandates imposed by Congress to mitigate the cyber security threat to the Agency and DoD.			
Accomplishments/Planned Programs Subtotals	0.462	0.456	0.612

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MC22 / <i>Cyber Operations</i>
--	--	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Cyber Defensive Operations - Cyber Defensive Operations	C/CPAF	MDIOC/Northrop : Grumman Mission Systems Colorado Springs, CO	1.106	0.462	Nov 2015	0.456	Dec 2016	0.612	Jan 2018	-		0.612	Continuing	Continuing	Continuing
Subtotal			1.106	0.462		0.456		0.612		-		0.612	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.106	0.462	0.456	0.612	-	0.612	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MC22 / <i>Cyber Operations</i>
--	--	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆							
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇							
					FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
MC22 Cyber Operations					◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MC22 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC22 Cyber Operations	1	2016	4	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / Missile Defense Integration and Operations Center (MDIOC)	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: Program-Wide Support	11.813	2.142	2.521	2.392	-	2.392	2.627	2.679	2.831	2.862	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
In FY 2016, FY 2017, and FY 2018 Program Wide Support reflects proportional changes as a result of budget changes to the Missile Defense Integration and Operations Center. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests on the R-3

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	2.142	2.521	2.392
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	2.142	2.521	2.392

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities, Operations, and Maintenance	MIPR	Various : Multi: AK, AL, CA, CO, VA	5.301	0.010		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	0.314	0.000		0.178	Jul 2017	0.048	Jul 2018	-		0.048	0.241	0.781	0
Program Wide Support - Agency Operations and Support Services	Reqn	Various : Multi: AK, AL, CA, CO, VA	6.198	2.132	Dec 2015	2.145	Nov 2016	2.344	Nov 2017	-		2.344	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services.	C/CPFF	Various : Alatec INC, AL, CO, VA	0.000	0.000		0.198	Aug 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			11.813	2.142		2.521		2.392		-		2.392	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	11.813	2.142	2.521	2.392	-	2.392	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆																
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 10%;">FY 2016</th> <th style="width: 10%;">FY 2017</th> <th style="width: 10%;">FY 2018</th> <th style="width: 10%;">FY 2019</th> <th style="width: 10%;">FY 2020</th> <th style="width: 10%;">FY 2021</th> <th style="width: 10%;">FY 2022</th> </tr> </thead> <tbody> <tr> <td>MD40 Program-Wide Support</td> <td>◇◇◇◇</td> <td>◇◇◇◇</td> <td>◇◇◇◇</td> <td>◇◇◇◇</td> <td>◇◇◇◇</td> <td>◇◇◇◇</td> <td>◇◇◇◇</td> </tr> </tbody> </table>						FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	MD40 Program-Wide Support	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022													
MD40 Program-Wide Support	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇													

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / <i>Missile Defense Integration and Operations Center (MDIOC)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603906C / <i>Regarding Trench</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	53.842	8.918	8.785	9.113	-	9.113	17.100	18.798	12.377	12.721	Continuing	Continuing
MD35: <i>Regarding Trench</i>	53.842	8.918	8.785	9.113	-	9.113	17.100	18.798	12.377	12.721	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	9.583	8.785	9.161	-	9.161
Current President's Budget	8.918	8.785	9.113	-	9.113
Total Adjustments	-0.665	0.000	-0.048	-	-0.048
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.447	0.000			
• SBIR/STTR Transfer	-0.218	0.000			
• Other Adjustment	0.000	0.000	-0.048	-	-0.048

Change Summary Explanation

Further program details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603907C / <i>Sea Based X-Band Radar (SBX)</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	350.627	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
<i>MX46: Sea Based X-Band Radar Development Support</i>	336.840	78.108	90.178	126.737	-	126.737	110.449	120.400	92.966	93.001	Continuing	Continuing
<i>MD40: Program-Wide Support</i>	13.787	3.157	3.109	3.958	-	3.958	4.096	5.850	4.700	4.658	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

FY2018 increase provides increase from 120-days to 230-days at sea for multiple operations, additional sustainment and test support.

A. Mission Description and Budget Item Justification

The SBX is an advanced X-Band radar that provides the capability for mid-course acquisition, tracking, discrimination and hit-assessment of ballistic missiles. The SBX radar is mounted on a mobile, ocean-going, semi-submersible platform, enabling it to cover any region of the globe. The SBX supports the Ballistic Missile Defense System (BMDS) Homeland defense mission by tracking and discriminating sophisticated Intercontinental Ballistic Missile (ICBM) threats.

SBX Multiple Operations and Test Support status includes 230-days at sea per year for BMDS flight and ground test participation while remaining recallable to an active, operational status when indications and warnings signal the need for enhanced discrimination. The SBX is located in a Pacific port when not required at sea. The SBX maintains vessel certifications for operations at sea as well as software compatibility with the BMDS.

FY 2017 Amended Budget Request Justification: \$+24.500M is required to address emergency warfighting readiness requirements to ensure readiness of the BMDS. \$+9.400M Project MX46-SBX Radar Dev Support/XBR Operations and Support to 1) extend SBX Operations to support NORTHCOM readiness requirements, 2) address emerging DoD Execution Order requiring implementation of a DoD Regional Clock for the BMDS to improve warfighter readiness by ensuring integrity and availability of positioning data, and 3) update X-Band Radar and GMD Fire Control (GFC) interfaces to the x86 architecture to resolve incompatibility and increase radar availability. \$+15.100M Project MX46-SBX Radar Dev Support/Vessel Operations and Support to 1) upgrade and obtain military certification for flight deck use for helicopters up to 16 tons, day or night without maintenance facilities (NAVAIR Level 2 Class 3) to support passenger transfer, resupply and increase radar availability.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603907C / <i>Sea Based X-Band Radar (SBX)</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	71.266	68.787	73.329	-	73.329
Current President's Budget	81.265	93.287	130.695	-	130.695
Total Adjustments	9.999	24.500	57.366	-	57.366
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	9.999	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	24.500	57.366	-	57.366

Change Summary Explanation

The FY 2016 increase supports vessel maintenance and upgrades (flight deck certification, hull painting and caterpillar diesel engine overhauls). FY 2017 Amended Budget Request Justification: \$+24.500M is required to address emergency warfighting readiness requirements to ensure readiness of the BMDS. The increase in FY2018 from PB17 to PB18 provides additional sustainment and an increase from 120-days to 230-days at sea for multiple operations and test support.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)				Project (Number/Name) MX46 / Sea Based X-Band Radar Development Support			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MX46: Sea Based X-Band Radar Development Support	336.840	78.108	90.178	126.737	-	126.737	110.449	120.400	92.966	93.001	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

This project provides developmental operations and support of the SBX Radar and its four major sub-systems: the self-propelled vessel; the X-Band Radar (XBR); the In-Flight Interceptor Communications System Data Terminal; and the communications network. Developmental operations and support activities include operation and sustainment of the vessel, developmental operation and sustainment of the XBR, limited XBR software support and vessel and shore side security.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Vessel Operations and Support	46.574	35.920	79.082
Articles:	-	-	-
Description: Vessel Operations and Support provides for sustainment of the SBX vessel in Multiple Operations and Test Support status. This effort maintains annual surveys and U.S. Coast Guard Certifications to ensure readiness for operational contingencies. The SBX participates in Ballistic Missile Defense System (BMDS) Ground Tests and Flight Tests per the Integrated Master Test Plan (IMTP). Specific and/or unique accomplishments to each FY are as follows:			
FY 2016 Accomplishments: -Supported vessel maintenance and upgrades to include flight deck certification, hull painting and caterpillar diesel engine overhauls.			
FY 2017 Plans: -Initiate upgrade for military flight deck use and obtain military certification for helicopters up to 16 tons, day or night without maintenance facilities (NAVAIR Level 2 Class 3) to support passenger transfer, resupply and to expedite transportation of parts and material -Initiate extended SBX Operations to support NORTHCOM readiness requirements			
FY 2018 Plans: -Increased vessel sustainment and days at sea from 120 to 330 for full operations			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)	Project (Number/Name) MX46 / Sea Based X-Band Radar Development Support		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
-Continue upgrade for military flight deck				
Title: System Force Protection Description: This effort provides force protection for SBX. FY 2016 Accomplishments: SEE ABOVE FY 2017 Plans: SEE ABOVE FY 2018 Plans: -Continue force protection, increasing days at sea from 120 to 330 for full operations		Articles: 3.148 -	Articles: 3.070 -	Articles: 5.869 -
Title: XBR Operations and Support Description: This effort operates and sustains the X-Band Radar (XBR), operates and sustains SBX communications systems, performs mission integration functions and provides support for contingency operations with manning for improved readiness and short time from notification to underway. XBR Operations and Support maintains limited software sustainment for system capability with the BMDS and fields additional XBR capability to the Warfighter (added to Build 3 software) with the BMDS capability update. This effort also provides precision track, discrimination and hit assessment for engagement support in (BMDS) Ground Tests and Flight Tests per the approved Integrated Master Test Plan (IMTP). FY 2016 Accomplishments: SEE ABOVE FY 2017 Plans: -Initiate update to X-Band Radar and GMD Fire Control (GFC) interfaces to the x86 architecture to resolve incompatibility and increase radar availability -Initiate x86 XBR superdome replacement to address obsolescence requirements and increase the XBR processing capabilities -Initiate implementation of a DoD Regional Clock for the BMDS to improve warfighter readiness by ensuring integrity and availability of positioning data in order to address emerging DoD Execution Order FY 2018 Plans: -Decrease reflects completion of X-Band Radar and GFC interface to the x86 architecture -Continue XBR Operations and Support, increasing days at sea from 120 to 330 for full operations		Articles: 28.386 -	Articles: 51.188 -	Articles: 41.786 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)	Project (Number/Name) MX46 / Sea Based X-Band Radar Development Support

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-Continue x86 XBR superdome replacement to address obsolescence requirements and increase the XBR processing capabilities			
-Complete implementation of a DoD Regional Clock for the BMDS to improve warfighter readiness by ensuring integrity and availability of positioning data in order to address emerging DoD Execution Order			
Accomplishments/Planned Programs Subtotals	78.108	90.178	126.737

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603891C: <i>Special Programs - MDA</i>	390.264	323.607	320.190	-	320.190	273.713	254.407	265.119	270.417	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603898C: <i>Ballistic Missile Defense Joint Warfighter Support</i>	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0604879C: <i>Ballistic Missile Defense Sensor Test</i>	83.597	83.250	84.239	-	84.239	65.886	76.218	68.231	56.579	Continuing	Continuing

Remarks

D. Acquisition Strategy

SBX is contractor operated and maintained through a variety of contracts between the Navy and Missile Defense Agency (MDA). SBX-1 Vessel Management and Security contracts are managed by Military Sealift Command. The SBX radar is operated and maintained on contracts managed by MDA.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / <i>Sea Based X-Band Radar (SBX)</i>	Project (Number/Name) MX46 / <i>Sea Based X-Band Radar Development Support</i>

E. Performance Metrics N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)	Project (Number/Name) MX46 / Sea Based X-Band Radar Development Support
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Vessel Operations and Support - Fuel	MIPR	Military Sealift Command : VA	31.134	6.919	Nov 2015	4.990	Nov 2016	9.885	Jan 2018	-		9.885	Continuing	Continuing	Continuing
Vessel Operations and Support - Navy Transition Office	MIPR	US Navy : AL	5.732	0.000		0.000		0.000		-		0.000	0	5.732	0
Vessel Operations and Support - Operational Support Vessel (OSV Resupply)	MIPR	Military Sealift Command : VA	0.000	0.000		0.000		14.670	Feb 2018	-		14.670	Continuing	Continuing	Continuing
Vessel Operations and Support - Program Management Office	MIPR	Military Sealift Command : VA	2.417	1.284	Nov 2015	1.010	Nov 2016	1.900	Oct 2017	-		1.900	Continuing	Continuing	Continuing
Vessel Operations and Support - SBX Operations & Support (Vessel)	C/FFP	Military Sealift Command : VA	97.525	24.675	Oct 2015	17.613	Oct 2016	33.654	Oct 2017	-		33.654	Continuing	Continuing	Continuing
Vessel Operations and Support - SBX Vessel Maintenance	C/FFP	Tote : HI/NJ	18.464	5.907	Oct 2015	3.677	Oct 2016	8.915	Mar 2018	-		8.915	Continuing	Continuing	Continuing
Vessel Operations and Support - Vessel Mission Integration	C/FFP	Gryphon Tech. : AL/ HI	31.436	7.789	Dec 2015	8.630	Dec 2016	10.058	Dec 2017	-		10.058	Continuing	Continuing	Continuing
System Force Protection - Force Protection	SS/CPFF	AQuate : Hi	19.119	3.148	Oct 2015	3.070	Oct 2016	5.869	Oct 2017	-		5.869	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
0400 / 4				PE 0603907C / Sea Based X-Band Radar (SBX)				MX46 / Sea Based X-Band Radar Development Support							
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
XBR Operations and Support - SBX Communications Support	SS/CPHF	Boeing : AL/HI	5.296	2.472	Dec 2015	2.640	Dec 2016	2.701	Nov 2017	-		2.701	Continuing	Continuing	Continuing
XBR Operations and Support - XBR Operations & Support	SS/CPHF	Raytheon : AL/AK/HI	125.717	25.914	Nov 2015	48.548	Nov 2016	39.085	Nov 2017	-		39.085	Continuing	Continuing	Continuing
Subtotal			336.840	78.108		90.178		126.737		-		126.737	-	-	-
Remarks															
N/A															
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	-
Remarks															
N/A															
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	-
Remarks															
N/A															
Project Cost Totals			336.840	78.108		90.178		126.737		-		126.737	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency							Date: May 2017			
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603907C / <i>Sea Based X-Band Radar (SBX)</i>			Project (Number/Name) MX46 / <i>Sea Based X-Band Radar Development Support</i>				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)	Project (Number/Name) MX46 / Sea Based X-Band Radar Development Support
--	--	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
GM CTV-02 Plus (GM, Intercept Flight Test)	▲													
FTG-15 (GM, Intercept Flight Test)				△										
FTG-11 (IOT&E) (GM, Intercept Flight Test)						△								
FTG-17 (IOT&E) (GM, Intercept Flight Test)											△			
FTG-18 (GM, Intercept Flight Test)														△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)	Project (Number/Name) MX46 / Sea Based X-Band Radar Development Support

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GM CTV-02 Plus (GM, Intercept Flight Test)	2	2016	2	2016
FTG-15 (GM, Intercept Flight Test)	3	2017	3	2017
FTG-11 (IOT&E) (GM, Intercept Flight Test)	4	2018	4	2018
FTG-17 (IOT&E) (GM, Intercept Flight Test)	1	2021	1	2021
FTG-18 (GM, Intercept Flight Test)	1	2022	1	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)	Project (Number/Name) MD40 / Program-Wide Support
--	--	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	13.787	3.157	3.109	3.958	-	3.958	4.096	5.850	4.700	4.658	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2016, FY 2017, and FY 2018 Program Wide Support reflects proportional changes as a result of budget changes to the Sea-Based X-Band Radar (SBX). Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	3.157	3.109	3.958
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	3.157	3.109	3.958

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / <i>Sea Based X-Band Radar (SBX)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)	Project (Number/Name) MD40 / Program-Wide Support
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities, Operations and Maintenance	MIPR	Various : Multi: AK, AL, CA, CO, VA	1.613	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	1.571	0.208		0.077	Jul 2017	0.079	Jul 2018	-		0.079	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPRs)	MIPR	Various : Multi: AL, CA, CO, VA	2.859	2.949		3.032	Mar 2017	3.879	Mar 2018	-		3.879	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (CPAF)	C/CPAF	Northrop Grumman : CO	7.541	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Various : Multi: VA,WA	0.203	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Dept of Labor : VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			13.787	3.157		3.109		3.958		-		3.958	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.787	3.157	3.109	3.958	-	3.958	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / Sea Based X-Band Radar (SBX)	Project (Number/Name) MD40 / Program-Wide Support
--	--	---

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

MD40 Program-Wide Support	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / <i>Sea Based X-Band Radar (SBX)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603913C / Israeli Cooperative Programs
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1,391.959	267.595	103.835	105.354	-	105.354	108.002	109.742	111.901	114.219	Continuing	Continuing
MD20: <i>Israeli Upper Tier</i>	394.255	74.550	55.793	56.861	-	56.861	58.285	59.225	60.392	61.631	Continuing	Continuing
MD26: <i>Israeli ARROW Program</i>	305.495	56.519	10.831	10.841	-	10.841	11.125	11.288	11.508	11.761	Continuing	Continuing
MD34: <i>Short Range Ballistic Missile Defense (SRBMD)</i>	692.209	136.526	37.211	37.652	-	37.652	38.592	39.229	40.001	40.827	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Content supports expected contributions from Israel per international agreements.

A. Mission Description and Budget Item Justification

Since 1986, the United States and the State of Israel have cooperated on missile defense. Currently, Missile Defense Agency (MDA) has three major projects with Israel to develop and improve their indigenous capability to defend against short and medium range ballistic missiles. These include Upper Tier Interceptors (MD20), the Arrow Weapon System (MD26) and the Short-Range Ballistic Missile Defense, also known as the David's Sling Weapon System (MD34). Within these projects MDA develops and produces weapon systems, conducts tests, and exercises interoperability between U.S. Ballistic Missile Defense System (BMDS) and the Israeli Missile Defense Architecture.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	267.595	103.835	105.612	-	105.612
Current President's Budget	267.595	103.835	105.354	-	105.354
Total Adjustments	0.000	0.000	-0.258	-	-0.258
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	-0.258	-	-0.258

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD20 / <i>Israeli Upper Tier</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD20: <i>Israeli Upper Tier</i>	394.255	74.550	55.793	56.861	-	56.861	58.285	59.225	60.392	61.631	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project code encompasses the Missile Defense Agency's (MDA) U.S.-Israeli cooperative program for the Israeli Upper Tier Program.

A. Mission Description and Budget Item Justification

Israeli Upper Tier Interceptor (UTI) Project (MD20): The Upper Tier Program provides the Arrow-3 missile, increasing the system's capability against advanced medium range threats by providing approximately four times the current Arrow-2 battle space. The primary near term objective is to complete and demonstrate Upper Tier design, and continue Initial Lot Production (ILP) deliveries.

This project provides funding for the Upper Tier component of the Arrow Weapon System (AWS) development. The United States through the cooperative effort gains knowledge and experience of the Israeli Defense Forces operation of a multi-layered defense architecture. This project also includes the procurement of the Silver Sparrow Air-Launched Target which is necessary to validate the performance of the Arrow-3 Missile and related Block 5 spiral development activities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Upper Tier Interceptor	74.550	55.793	56.861
Articles:	-	-	-
Description: The scope of the Upper Tier Program covers interceptor development, testing, material procurement to include initial lot production, and integration of spiral software development for Block 5 AWS. Recurring Accomplishments include: - Conduct Testing of the Arrow-3 Interceptor - Conduct algorithm design reviews to verify requirements - Continue Interceptor Spiral Development - Procurement and Delivery of Initial Lot Production assets and Test Articles			
Events unique to an FY are as follows:			
FY 2016 Accomplishments: With the 2016 congressional adds to the President's Budget: -Testing of the Arrow-3 Interceptor as scheduled in the R4A. -Test Number #2 and #3 design review.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD20 / <i>Israeli Upper Tier</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-Conducted Interceptor Production Readiness Review (PRR). <i>FY 2017 Plans:</i> -Testing of the Arrow-3 Interceptor as scheduled in the R4A. -Test Number #4 design review. <i>FY 2018 Plans:</i> -Testing of the Arrow-3 Interceptor as scheduled in the R4A. -Test Number #5 design review.			
Accomplishments/Planned Programs Subtotals	74.550	55.793	56.861

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Upper-Tier Interceptor Project Agreement under the Research, Development, Test and Evaluation (RDT&E) Framework agreement between the U.S. and Israel creates a joint program office to manage this program. Missile Defense Agency (MDA) and the Israeli Ministry of Defense (IMoD) continue to implement best management practices that allow for the more effective use of program management tools to ensure risk is adequately managed to include Knowledge Points that assess Israel's development progress. The DoD U.S. Israeli Cooperative Program Office jointly manages the Upper Tier program with IMoD to ensure that all systems are delivered on time, on budget, and meet the needs of the warfighter. The program is equitably funded between the U.S. and Israel. A portion of the Israeli cost share comes from non-financial contributions such as previously completed work prior to joint program initiation. Contracts are awarded by IMoD or MDA dependent on what is most advantageous to the Joint Governments. In regard to the Upper Tier Interceptor, IMoD will contract with Israel Aerospace Industries (IAI). IAI subcontracts with Israeli companies, Boeing and other U.S. companies.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD20 / <i>Israeli Upper Tier</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Upper Tier Interceptor - Upper Tier Interceptor	C/CPFF	Israel Aerospace Industries (IAI) : Israel	394.255	74.550	Dec 2015	55.793	Dec 2016	56.861	Dec 2017	-		56.861	Continuing	Continuing	Continuing
Subtotal			394.255	74.550		55.793		56.861		-		56.861	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD20 / <i>Israeli Upper Tier</i>
--	---	--

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	394.255	74.550	55.793	56.861	-	56.861	-	-	-

Remarks
Contract cost reflect U.S. contribution only. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD20 / <i>Israeli Upper Tier</i>
--	---	--

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	◆	◆	◆	◆	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Israeli Cooperative Arrow 3 Intercept Test #1- FY 2016	◆	◆	◆	◆																								
Israeli Cooperative Arrow 3 Intercept Test #2- FY 2017					◇	◇	◇	◇																				
Israeli Cooperative Arrow 3 Intercept Test #3 FY 2018									◇	◇	◇	◇																
Israeli Cooperative Arrow 3 Intercept Test #4- FY 2019													◇	◇	◇	◇												
Israeli Cooperative Arrow 3 Intercept Test #5- FY 2020																	◇	◇	◇	◇								
Israeli Cooperative Arrow 3 Intercept Test #6 FY 2021																					◇	◇	◇	◇				
Israeli Cooperative Arrow 3 Intercept Test #7- FY 2022																									◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD20 / <i>Israeli Upper Tier</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Israeli Cooperative Arrow 3 Intercept Test #1- FY 2016	1	2016	4	2016
Israeli Cooperative Arrow 3 Intercept Test #2- FY 2017	1	2017	4	2017
Israeli Cooperative Arrow 3 Intercept Test #3 FY 2018	1	2018	4	2018
Israeli Cooperative Arrow 3 Intercept Test #4- FY 2019	1	2019	4	2019
Israeli Cooperative Arrow 3 Intercept Test #5- FY 2020	1	2020	4	2020
Israeli Cooperative Arrow 3 Intercept Test #6 FY 2021	1	2021	4	2021
Israeli Cooperative Arrow 3 Intercept Test #7- FY 2022	1	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD26 / <i>Israeli ARROW Program</i>
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD26: <i>Israeli ARROW Program</i>	305.495	56.519	10.831	10.841	-	10.841	11.125	11.288	11.508	11.761	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project code encompasses the Missile Defense Agency's (MDA) U.S.-Israeli cooperative program for the Israeli Arrow Weapon System Program.

A. Mission Description and Budget Item Justification

Israeli Arrow Weapon System (AWS) (MD26): The Arrow System Improvement Program (ASIP) includes block upgrades to the AWS that enhances capabilities against evolving medium range threats by increasing the total defended area by approximately 50 percent. ASIP elements include the Arrow-2 missile and launcher, Citron Tree Battle Management Center (BMC), Green Pine (GP) and Super Green Pine (SGP) Radars, and the Hazelnut Tree Launcher Control Center (LCC). Also included is the integration of Block 5 assets which include the Arrow-3 missile and launcher.

Arrow Block 5 development will also incorporate a Long Range Detection suite that consists of an unmanned aerial vehicle Airborne Early Warning System (ABEWS) and a S-Band Silver Oak radar for increased sensor range, early detection and enhanced raid size capacity. The program also includes the continued development of Arrow's interoperability with U.S. BMDS.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Arrow System Improvement Program	50.157	4.469	4.479
Articles:	-	-	-
Description: The Arrow Weapon System (AWS) continues development of Block 4 and Block 5 spiral development. Included is the integration of Block 5 assets which consists of the Arrow-3 missile, launcher and the Long Range Detection Suite (LRDS).			
FY 2016 Accomplishments: With the 2016 congressional adds to the President's Budget: -Continued Block 5 Arrow Weapon System integration. -Continued Long Range Detection Suite Development. -Continued Lab and flight testing and analysis to demonstrate and complete Knowledge Points.			
FY 2017 Plans: -See description			
FY 2018 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD26 / <i>Israeli ARROW Program</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-See description			
<p>Title: Israeli Test Bed (ITB)</p> <p align="right">Articles:</p> <p>Description: The Israeli Test Bed (ITB) provides experiments to evaluate Human Machine Interface (HMI) battle management and integration of Block 5 Arrow Weapon System TTPs and CONOPs.</p> <p>FY 2016 Accomplishments: -See description.</p> <p>FY 2017 Plans: -See description.</p> <p>FY 2018 Plans: -See description.</p>	3.535 -	3.535 -	3.535 -
<p>Title: Israeli Systems Architecture and Integration (ISA&I)</p> <p align="right">Articles:</p> <p>Description: Israeli Systems Architecture and Integration conducts studies to assess Israel's future 2025 Missile Defense Architecture. This identifies the preferred missile defense architecture and reference threat for 10-15 year future epoch and interoperability special studies on regional threats and growth path options.</p> <p>FY 2016 Accomplishments: -See description.</p> <p>FY 2017 Plans: -See description.</p> <p>FY 2018 Plans: -See description.</p>	2.827 -	2.827 -	2.827 -
Accomplishments/Planned Programs Subtotals	56.519	10.831	10.841

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD26 / <i>Israeli ARROW Program</i>

D. Acquisition Strategy

The DoD U.S. Israeli Cooperative Program Office jointly manages the Arrow Program with Israel Ministry of Defense (IMoD) to ensure that all systems are delivered with quality on time, on budget, and meet the needs of the warfighter. The program funding is equitably funded between the U.S. and Israel with Israel providing matching contributions. However, a portion of the Israeli cost share comes from non-financial contributions such as previously completed work prior to joint program initiation. Contracts are awarded by IMoD or MDA dependent on what is most advantageous to the Joint Governments. In regard to Arrow System Improvement Program (ASIP), IMoD contracts on behalf of U.S. government with Israel Aerospace Industries (IAI). IAI subcontracts with Israeli and U.S. companies. For the Israeli Test Bed, the Missile Defense Agency (MDA) contracts directly with Elbit Systems, Ltd. while IMoD provides an equitable share of the funding to the U.S. Finally, MDA contracts directly with WALES, Ltd for the Israeli System Architecture and Integration program.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD26 / <i>Israeli ARROW Program</i>
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Arrow System Improvement Program - Arrow System Improvement Program (ASIP)	C/CPFF	Israel Aerospace Industries (IAI) : Israel	263.691	50.157	Dec 2015	4.469	Dec 2016	4.479	Dec 2017	-		4.479	Continuing	Continuing	Continuing
Israeli Test Bed (ITB) - Israeli Test Bed	C/FFP	Elbit Systems : Israel	24.745	3.535	Oct 2015	3.535	Dec 2016	3.535	Dec 2017	-		3.535	Continuing	Continuing	Continuing
Israeli Systems Architecture and Integration (ISA&I) - ISA&I	C/FFP	Wales LTD : Israel	17.059	2.827	Oct 2015	2.827	Dec 2016	2.827	Dec 2017	-		2.827	Continuing	Continuing	Continuing
Subtotal			305.495	56.519		10.831		10.841		-		10.841	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD26 / <i>Israeli ARROW Program</i>
--	---	---

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	305.495	56.519	10.831	10.841	-	10.841	-	-	-

Remarks
Contract cost reflect U.S. contribution only.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD26 / <i>Israeli ARROW Program</i>
--	---	---

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2016	◆	◆	◆	◆																								
Israeli Test Bed Experiments FY 2016	◆	◆	◆	◆																								
Israeli Test Bed Exercise with Warfighter FY2016	◆	◆	◆	◆																								
Israeli Test Bed Experiments FY 2017					◇	◇	◇	◇																				
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2017					◇	◇	◇	◇																				
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2018									◇	◇	◇	◇																
Israeli Test Bed Experiments FY 2018									◇	◇	◇	◇																
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2019													◇	◇	◇	◇												
Israeli Test Bed Experiments FY 2019													◇	◇	◇	◇												
Israeli Test Bed Experiments FY 2020																	◇	◇	◇	◇								
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2020																	◇	◇	◇	◇								
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2021																					◇	◇	◇	◇				
Israeli Test Bed Experiments FY 2021																					◇	◇	◇	◇				
Israeli Test Bed Experiments FY 2022																												◇
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2022																											◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD26 / <i>Israeli ARROW Program</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2016	1	2016	4	2016
Israeli Test Bed Experiments FY 2016	1	2016	4	2016
Israeli Test Bed Exercise with Warfighter FY2016	1	2016	4	2016
Israeli Test Bed Experiments FY 2017	1	2017	4	2017
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2017	1	2017	4	2017
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2018	1	2018	4	2018
Israeli Test Bed Experiments FY 2018	1	2018	4	2018
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2019	1	2019	4	2019
Israeli Test Bed Experiments FY 2019	1	2019	4	2019
Israeli Test Bed Experiments FY 2020	1	2020	4	2020
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2020	1	2020	4	2020
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2021	1	2021	4	2021
Israeli Test Bed Experiments FY 2021	1	2021	4	2021
Israeli Test Bed Experiments FY 2022	4	2022	4	2022
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2022	1	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603913C / Israeli Cooperative Programs				Project (Number/Name) MD34 / Short Range Ballistic Missile Defense (SRBMD)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD34: Short Range Ballistic Missile Defense (SRBMD)	692.209	136.526	37.211	37.652	-	37.652	38.592	39.229	40.001	40.827	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project code encompasses the Missile Defense Agency's (MDA) U.S.-Israeli cooperative program for the Israeli David's Sling Weapon System Program.

A. Mission Description and Budget Item Justification

Short Range Ballistic Missile Defense (SRBMD) (MD34): SRBMD, also known as the David's Sling Weapon System (DSWS), is designed to counter short range rockets, cruise missiles, and tactical ballistic missiles and will be integrated into the Israeli Missile Defense Architecture adding another layer of defense to the current Arrow System. The David's Sling Weapon System (DSWS) includes the Stunner Interceptor, Missile Firing Unit (MFU), Multi-Mission Radar (MMR), Launch Site Controller (LSC), Data Link (DL) and the Golden Almond Battle Management Center (BMC).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: SRBMD Program	136.526	37.211	37.652
Articles:	-	-	-
<p>Description: The scope of the David's Sling Weapon System covers system development, testing, material procurement to include initial lot production, and integration of spiral software development for Blocks 1-3. Block 1 capability will enhance the short range rocket and missile defense capability. Block 2 will add capability to defend against medium range and cruise missiles. Block 3 will provide robust defense capability and add significant detection capability to the Israeli Air Defense Architecture. Recurring Accomplishments include:</p> <ul style="list-style-type: none"> - Conduct Testing of the DSWS <p>Events unique to an FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> With the 2016 congressional adds to the President's Budget: -Delivered Initial Lot Production (ILP) Interceptors to the Israeli Air Force. -Block One system intercept test with ILP Interceptor to demonstrate production stunner performance. -Continued Block 2 Development -Completed remaining Block One Knowledge Points and conduct final Performance Design Review -Conducted ground test and simulations to validate missile and system performance and provide data to assess subsystem and system design robustness. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD34 / <i>Short Range Ballistic Missile Defense (SRBMD)</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-Conducted ILP Production Readiness Review -Conducted Test Mission Readiness Review for FY2017 Block One Flight Tests FY 2017 Plans: -Block One system intercept test with ILP Interceptor to demonstrate production stunner performance. -Deliver final Initial Lot Production (ILP) Interceptors to the Israeli Air Force FY 2018 Plans: -Block 2 System Intercept Test to demonstrate initial cruise missile defense performance			
Accomplishments/Planned Programs Subtotals	136.526	37.211	37.652

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Short Range Ballistic Missile Defense (SRBMD), also known as the David's Sling Weapon System (DSWS) Project Agreement under the Research, Development, Test and Evaluation (RDT&E) Framework agreement between the U.S. and Israel creates a joint program office to manage this program. Missile Defense Agency (MDA) and the Israeli Ministry of Defense (IMoD) continue to implement management practices that allow for the more effective use of program management tools to ensure risk is adequately managed to include Knowledge Points that assess Israel's development progress. The DoD U.S. Israeli Cooperative Program Office jointly manages the SRBMD/DSWS program with IMoD to ensure that all systems are delivered in an effective manner, and meet the needs of the warfighter. The program is equitably funded between the U.S. and Israel. A portion of the Israeli cost share comes from non-financial contributions such as previously completed work prior to joint program initiation. Contracts are awarded by IMoD or MDA dependent on what is most advantageous to the Joint Governments. For the Stunner Interceptor, Rafael Advanced Systems (an Israeli company), subcontracts to Raytheon Missile Systems for Stunner interceptor components.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / Israeli Cooperative Programs	Project (Number/Name) MD34 / Short Range Ballistic Missile Defense (SRBMD)
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SRBMD Program - SRBMD Program	C/CPFF	Rafael : Israel	692.209	136.526	Dec 2015	37.211	Dec 2016	37.652	Dec 2017	-		37.652	Continuing	Continuing	Continuing
Subtotal			692.209	136.526		37.211		37.652		-		37.652	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD34 / <i>Short Range Ballistic Missile Defense (SRBMD)</i>
--	---	---

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	692.209	136.526	37.211	37.652	-	37.652	-	-	-

Remarks
Contract cost reflect U.S. contribution only.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD34 / <i>Short Range Ballistic Missile Defense (SRBMD)</i>
--	---	---

	Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆											
	Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇											
	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
System Flight Test #4 FY 2016	◆	◆	◆	◆																								
System Flight Test #5 FY 2017					◇	◇	◇	◇																				
System Flight Test #6 FY 2018									◇	◇	◇	◇																
System Flight Test #7 FY 2019													◇	◇	◇	◇												
System Flight Test #8 FY 2020																	◇	◇	◇	◇								
System Flight Test #9 FY 2021																					◇	◇	◇	◇				
System Flight Test #10 FY 2022																									◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / <i>Israeli Cooperative Programs</i>	Project (Number/Name) MD34 / <i>Short Range Ballistic Missile Defense (SRBMD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
System Flight Test #4 FY 2016	1	2016	4	2016
System Flight Test #5 FY 2017	1	2017	4	2017
System Flight Test #6 FY 2018	1	2018	4	2018
System Flight Test #7 FY 2019	1	2019	4	2019
System Flight Test #8 FY 2020	1	2020	4	2020
System Flight Test #9 FY 2021	1	2021	4	2021
System Flight Test #10 FY 2022	1	2022	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1,390.957	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
MD04: <i>BMDS Test Development Program</i>	-	0.000	0.000	0.000	-	0.000	0.000	17.500	28.900	22.600	0	69.000
MT04: <i>BMDS Test Program</i>	1,325.821	276.311	277.851	288.516	-	288.516	278.141	315.226	288.333	293.327	Continuing	Continuing
MC04: <i>Cyber Operations</i>	2.181	2.072	2.479	2.528	-	2.528	2.578	2.631	2.682	2.737	Continuing	Continuing
MD40: <i>Program Wide Support</i>	62.955	11.884	13.111	14.747	-	14.747	14.323	16.269	16.222	16.014	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

The increase from FY 2017 to FY 2018 is due to the addition of Integrated Master Test Plan flight test execution and logistics at Wake Island.

A. Mission Description and Budget Item Justification

MDA utilizes a disciplined system engineering process to develop and integrate the BMDS into an effective, layered defense against ballistic missiles of all ranges during all phases of flight. This process consists of the following steps: Plan, Define, Design, Build, Test and Verify, Assess, and Deliver BMDS Capability, followed by transfer of selected capabilities. The BMDS Test Program Element (PE) is responsible for testing that provides critical data to: determine validity of models and simulations used to verify and assess BMDS capabilities; validate that Elements and Components are properly designed, built, and integrated; and to provide confidence that the BMDS will perform as designed, and support system performance assessment for incremental capability delivery decisions. Results from the Test and Verify step provide feedback into the Plan, Define, and Design steps to identify areas for system improvements. Key to the systems engineering process is Modeling and Simulation (M&S), which reflects the integrated operational system's performance. Confidence in M&S is based on a comprehensive Verification, Validation, and Accreditation (VV&A) process. The BMDS Test Program, as documented in the Integrated Master Test Plan (IMTP), has a primary emphasis to provide the data necessary to verify and assess BMDS capabilities in support of Technical Capability Declarations, and to anchor BMDS M&S. As models are validated and accredited, MDA and the BMDS OTA Team will utilize these models to assess BMDS capabilities through a campaign of ground testing.

BMDS Test Program Functions include:

- Represent MDA as the single test authority to the test and evaluation community, international cooperative program representatives, and other organization representatives on test matters
- Develop and implement MDA test policy, standards, tools, products, and processes to enable effective tests while balancing MDA and element programmatic needs
- Develop an IMTP that compiles all MDA test objectives, test schedules, and funding requirements from the year of execution through the Future Years Defense Program time period and beyond (through FY 2024)
- Provide, maintain, and develop common test resources and infrastructure required to execute tests in the MDA Test Program by leveraging element laboratories, ranges, executing agents, and functional expertise, as applicable
- Act as the single point of contact in MDA for all external ranges and common test resources

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>
---	---

- Collect, archive, and distribute all MDA test data/information
- Certify that test personnel are trained and equipped to conduct safe and effective tests
- Provide test personnel and support services to plan and execute tests

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	281.740	293.441	337.537	-	337.537
Current President's Budget	290.267	293.441	305.791	-	305.791
Total Adjustments	8.527	0.000	-31.746	-	-31.746
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	8.527	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	-31.746	-	-31.746

Change Summary Explanation

The decrease in FY2018 from PB17 to PB18 is due to other higher priority agency initiatives and includes reduced contract spending for Mission Support Services in accordance with Department Service Requirement Review Board reductions through increased competition.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>				Project (Number/Name) MD04 / <i>BMDS Test Development Program</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD04: <i>BMDS Test Development Program</i>	-	0.000	0.000	0.000	-	0.000	0.000	17.500	28.900	22.600	0	69.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The new MD04 project executes in FY 2020 to support Continuous Integration/Continuous Agile Testing (CI/CAT).

A. Mission Description and Budget Item Justification

The BMDS Test Program will implement a Continuous Integration capability to support Continuous Agile Testing approach for integrated ground testing.

The BMDS Test Program will upgrade BMDS Integration and Development (BID) Lab and acquire additional BMDS Hardware-In-The-Loop simulation assets to support element pairwise and ensemble testing, provide test content flexibility and provide a venue to integrate the BMDS before entering formal ground tests (GT).

B. Accomplishments/Planned Programs (\$ in Millions)

N/A

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The BMDS Test Program acquisition strategy is consistent with the MDA capabilities-based acquisition strategy that emphasizes testing, evolutionary acquisition, and knowledge-based funding. Test directs a team of various internal staff (government and scientific, engineering and technical assistance support), executing agents (including DoD agencies, Service Organizations, Laboratories and Program Offices, Federally Funded Research and Development Center (FFRDC), and other MDA programs to execute the various diverse efforts within the BMDS test program through competition. When a specific effort/activity requires the use of an executing agent, respective headquarter regulations are used to conform the acquisition strategy.

The BMDS IMTP establishes and documents the test requirements for the BMDS with the specific focus on collecting the data needed for the Verification, Validation, and Accreditation (VV&A) of the BMDS Models and Simulations (M&S). This paradigm uses critical factor analysis to drive test design, planning, and execution for accrediting M&S, which is used to validate and assess system performance. With this test approach, MDA will establish confidence that the M&S used to evaluate the BMDS represent real world behavior, thereby enabling simulation-based performance assessment to verify system functionality.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MD04 / <i>BMDS Test Development Program</i>

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MD04 / <i>BMDS Test Development Program</i>

Remarks

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017						
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>				Project (Number/Name) MD04 / <i>BMDS Test Development Program</i>				
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆								
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇								
				FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022		
Continuous Integration/Continuous Agile Testing (CI/CAT)								◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MD04 / <i>BMDS Test Development Program</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Continuous Integration/Continuous Agile Testing (CI/CAT)	1	2020	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT04: <i>BMDS Test Program</i>	1,325.821	276.311	277.851	288.516	-	288.516	278.141	315.226	288.333	293.327	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2017 to FY 2018 is due to increase requirements for the FTO-03 intercept flight test.

A. Mission Description and Budget Item Justification

The Test Program provides consolidated MDA capabilities and resources to support the management and execution of BMDS and Element-level testing.

The MDA Test Program is responsible for all BMDS testing and relies on BMDS Systems Engineering to provide the system test objectives that define the test architecture by developing, updating, coordinating, and assessing the IMTP. The MDA Test Program plans and executes BMDS test events and develops the necessary test policy, test plans, and test infrastructure to conduct an effective test program. The goals of this budget project are to sustain and improve a robust testing program and to enhance M&S efforts to provide, in conjunction with flight and ground testing, confidence to the Combatant Commanders that the missile defense system works.

Activities are grouped into five major areas: 1) Program Planning and Operations; 2) Flight Test; 3) Ground Test; 4) Test Resources; and 5) Engineering Test Analysis.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Planning and Operations	98.395	97.780	100.203
Articles:	-	-	-
Description: The BMDS Test program is responsible for the following Program Planning and Operational activities:			
<ul style="list-style-type: none"> - Develop, update, coordinate and deliver the IMTP, which is coordinated with MDA and External stakeholders (Director, Operational Test and Evaluation (DOT&E); the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation (DASD(DT&E)); the Joint Functional Component Command for Integrated Missile Defense (JFCC-IMD); and the Operational Test Agency (OTA)), and provide an affordable and executable test plan to meet Warfighter needs and National Security commitments. - Coordinate the IMTP Special Access Programs (SAP) Annex with respect to changes to SAP Program Test Baseline and synchronize with the collateral IMTP. - Serve as the MDA Test Interface/Liaison with the DOT&E to; the DASD(DT&E); JFCC-IMD; and the BMDS OTA. - Provide BMDS OTA System Team funding for personnel support of system level testing and conduct cybersecurity assessments of BMDS. - Plan, coordinate and execute cyber security testing of the BMDS. - Execute Flight Test Design Analysis ensuring test designs are safe and sufficient to meet test objectives. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Execute ground test planning activities supporting MDA test requirements and priorities to include test design, test integration, digital assessment, and international testing. - Update and maintain the classified Test Resource Mission Planning-Tool (Classified), TRMP-T(C) database. - Manage the approved test baseline by assessing all proposed changes to the BMDS Test Schedule and Test Configurations for each BMDS test event identified in the IMTP. - Support the Developmental Baseline Reviews and the annual BMDS Accountability Reviews to assess baseline execution risk and verify BMDS components are consistent with the approved test baseline. - Establish authority and maintain configuration control of the test baseline. - Review BMDS component programs' content on a quarterly basis to ensure consistency with the approved IMTP. - Serve as a voting member of the Failure Review, Analysis, and Corrective Action System (FRACAS) board to establish requirements for identifying, tracking, reporting, modifying, and closing BMDS Discrepancy Reports (BDRs). - Provide strategic technical planning support for the Test and Evaluation Standing Committee (TESC). - Provide the BMDS Test program director analytical capability for Flight and Ground test planning to include: test design feasibility assessments; flight safety, telemetry link margin, collision avoidance, pre- and post-test trajectory and truth sensor analysis; and Signatures Working Group activities. - Support Integration Synchronization Group (ISG) and the Program Change Board (PCB), establish authority and maintain configuration control of the test baseline via the Test Baseline Working Group. - Develop and maintain integrated test tools to support Truth Data Requirements Documents, Truth Data Packages, on-site Truth Quick-Look product development, pre- and post-test analysis test planning, and resource de-confliction; Integrated Data Management Plans (IDMPs), Data Handling Plans (DHPs), Information Assurance (IA) documentation, data planning and management, library operations, deployment process; infrastructure requirements process; and test operations support. - Manage the Missile Defense Data Center (MDDC) Program and its library, operations, and infrastructure providing centralized data management, archival, and distribution services. - Utilize the Program Integration Center for analytical needs in support of Flight and Ground Test Activities. - Provide analytical capability for Flight and Ground test planning to include: test design feasibility assessments, truth data and sensor analysis, truth data requirements documentation and data packages; flight safety analysis and flight safety data packages; and telemetry link margin, collision avoidance, and pre- and post-test trajectory analyses. - Chair a working group to define Flight Test pre-mission analysis input products/models and Post Intercept Debris (PID) scenes for new targets. - Develop, maintain, and integrate test tools to support pre- and post-test flight analysis and ground test design/analysis, truth data, and on-site Truth Quick-Look product development. - Coordinate budget planning and execution activities as well as manpower activities. - Maintain professional excellence and a diverse and professional workforce. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> Completion of the BMDS Test program planning and operational requirements as stated in the Description above.</p> <p><i>FY 2017 Plans:</i> Continuation of the BMDS Test program planning and operational requirements as stated in the Description above.</p> <p><i>FY 2018 Plans:</i> Continuation of the BMDS Test program planning and operational requirements as stated in the Description above.</p>			
<p><i>Title:</i> Flight Test</p> <p align="right"><i>Articles:</i></p> <p><i>Description:</i> The Flight Test Execution program solely reflects the Integrated Master Test Plan (IMTP) cost model. The program integrates, manages, and executes flight tests using certified personnel and standardized processes and products to support Ballistic Missile Defense System (BMDS) fielding to the warfighter.</p> <ul style="list-style-type: none"> - Develop flight test training requirements for Test Directors and other console operators. - Identify mission risks and implemented mitigation practices as required ensuring safe & successful test outcomes. - Provide a Failure Response Team ensuring implementation of the response plan. Captures lessons learned for process improvement. - Train test personnel for each flight test and maintain training records for all test personnel. -- Train and resource System Mission Managers to lead Integrated Event Test Team mission management and readiness activities across all four test event phases for System and Element flight test and contingency operations. - Complete test planning for BMDS Flight Test events as shown in Exhibit R-4/4A Schedule. - Identify and execute focused investments in the BMDS test infrastructure. - Conduct mission planning and range coordination activities; provide communications security equipment and management for BMDS Flight Test events as shown in Exhibit R-4/4A Schedule. - Design and develop the Lessons Learned database; define process and procedures for flight and ground tests. - Identify, monitor and develop burn down plans for target system mission risks for all BMDS missions as defined in the IMTP schedule. <p><i>FY 2016 Accomplishments:</i> Completion of Flight Test Execution activities as stated above. Complete test planning for BMDS Flight Test events as shown in Exhibit R-4/4A Schedule.</p> <p><i>FY 2017 Plans:</i></p>	25.906 -	23.686 -	16.194 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
Continuation of the Flight Test Execution program as stated in the Description above. Complete test planning for BMDS Flight Test events as shown in Exhibit R-4/4A Schedule.				
FY 2018 Plans: Continuation of the Flight Test Execution program as stated in the Description above. Complete test planning for BMDS Flight Test events as shown in Exhibit R-4/4A Schedule. The decrease from FY 2017 is due to movement of FTO-03 E2 to FY 2019.				
Title: Ground Test		2.277	7.855	10.102
Articles:		-	-	-
Description: The Ground Test Execution program plans, designs, and executes BMDS ground tests in support of flight test risk reduction; BMDS fielding decisions; Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) assessments; and warfighter training. In addition, enables the warfighter to effectively employ, maintain, and sustain the BMDS and participate in the development of future missile defense capabilities through efficient ground testing. The Ground Test Execution program solely reflects the IMTP cost model.				
FY 2016 Accomplishments: Completion of the BMDS Test Program ground test execution activities as stated in the Description above.				
Addendum activities executed in FY 2016 are as follows: - Completed the GT-06 Part 2 campaign - Incorporated new cybersecurity testing. - Worked with international partners including NATO & Israel to incorporate their test requirements into the Department of Defense BMDS ground test. - Completed hardware and software testing in support of GTI-06 Part 2, GTI-ISR (Israeli) (16), GTD-06 Part 2 (BMDS Distributed Ground Test) and planning activities for GTI-07a and GTD-07a Part 1.				
FY 2017 Plans: Continuation of the Ground Test Execution program as stated in the Description above. - The increase from FY 2016 is due to execution of additional IMTP ground test events and completion of Dry Run/Runs for Record in GTI-07a and GTD-07a.				
Addendum activities planned in FY 2017 are as follows: - Complete cybersecurity red team testing in GTI-07a (BMDS Integrated Ground Test) event. - Support Early Integration activities for GTI-07b (EUCOM/CENTCOM) and Early Integration planning for GT-07b (NORTHCOM/PACOM).				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>- Complete hardware and software testing, truth drivers and framework integration, formal execution runs and/or official data collection in support of GTI-07a and GTD-07a Part 1. Conduct planning activities for GTX-07b, GTI-07b, GTD-07b P2 and GTD-07b P1, GT-08 and GTI-ISR (18).</p> <p>FY 2018 Plans: Continuation of the Ground Test Execution program as stated in the Description above. - The increase from FY 2017 is due to execution of additional IMTP ground test events, to include completion of Dry Run/Runs for Record for GTI-07b, GTI-067b and GTD-07b.</p> <p>Addendum activities planned in FY 2018 are as follows: - Continue to incorporate cybersecurity testing requirements into the BMDS ground tests to include planning for cyber requirements in FY 2019 GTD-07b test event. - Develop CONOPS to support Continuous Integration (CI)/ Continuous Agile Testing (CAT) emerging requirements, which begins execution in FY 2020. - Complete hardware and software testing, truth drivers and framework integration, formal execution runs and/or official data collection in support of GTI-07b (NORTHCOM/CENTCOM) and GTD-07b (USEUCOM/CENTCOM). Conduct planning activities for GTD-07b, and GT-08 campaign.</p>				
Title: Test Resources		123.298	120.725	131.636
Articles:		-	-	-
<p>Description: The BMDS Test Program procures, maintains, and manages test resource infrastructure and provides trained Test Resource Managers to integrate test resources into each test event for the BMDS Test Program.</p> <p>The Test Resources program is responsible for the following activities: - Maintain the MDA unique range facilities and mobile sensors, communication, data processing and dissemination infrastructure to support a broad spectrum of test requirements including metric tracking, target characterization, and multi-spectral imagery of BMDS phenomena. - Maintain and extend the Directorate of Test Support System (DTSS) classified Computer Network Defense Service Provider (CNDSP) to support network cyber security defense for ground test network systems. Continue to define cyber security investments, risks and benefits used to reduce vulnerabilities and protect critical administrative and test data. - Maintain accreditation of the Orion Voice Switch Conferencing System (VSCS). - Construct the new Wake Island communications facility and provide enhancements to the fiber backbone providing FTCN services to remote sites.</p> <p>FY 2016 Accomplishments:</p>				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Assessed degraded lodging capability on Wake Island and developed path forward to modernize/procure/construct housing. - Assisted in performing Wake upgrades to support 14 test events across the IMTP. - Began to implement findings from the Ground Test Continuous Integration (CI) strategy for improvements and potential new assets required to support the GT-07 and GT-08 Campaigns to address EPAA Phase 3. <p>FY 2017 Plans: Continuation of the Test Resources program as stated in the Description above. Addendum activities planned in FY 2017 are as follows:</p> <ul style="list-style-type: none"> - Conduct initial planning for the Airborne Sensors Fleet Renewal, scheduled to begin in FY 2018. - Conduct re-compete of the ARC contract with a potential award in FY 2018. - Complete technical refresh/replacement of the MDIOC Orion voice communication system. - Convert Pacific Collector's controllable pitch propeller (CPP) pitch controls from pneumatic to electronic and replace the CPP Oil Distribution (OD) box with MARAD spare OD box. - Take delivery of 101 TTS modified receivers eliminating obsolescence issues, completing IA upgrades, adding tier 1 & 2 modulation capability, and installing future C-band capability. - Complete qualification testing and take delivery of two dual-band (S&C band) transmitters produced under STTR program and plan shadow mode flight test on Target of Opportunity. - Incorporate infrared camera on ELTS radar to increase capability for collecting launch area and event phenomena, potentially improve radar accuracies, and improve visibility at night for radar calibration. - Upgrade the controls and power-pack systems on the Pacific Collector, and replace the OD Box with the MARAD spare. - Execute several mission support facility modernization projects, including work on mission critical Missile Assembly Buildings and test equipment storage facilities. - Support contract award for MILCON project to build a new \$11.67 million Wake Island Test Support Facility to be completed in 1QFY 2019. - Conduct facility upgrades and renovation as needed to meet test specific requirement to support BMDS test schedule, to include On-Condition Cyclic Maintenance on PVT Sorenson to ensure transportation needs for FTO-03. - Evaluate the condition of the Meck Island temporary housing for removal or storage for future test events. - Implement actions from the Ground Test Process Improvement Plan (GTPIP) strategy for improvements and potential new assets required to support the GT-07 and GT-08 Campaigns to address European Phased Adaptive Approach (EPAA) Phase 3. <p>FY 2018 Plans: The increase is due to early engineering for the replacement of the aging HALO and ABS Obsolete platforms to meet FAA requirements by FY 2020.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Continuation of the Test Resources program as stated in the Description above. Addendum activities planned in FY 2018 are as follows: <ul style="list-style-type: none"> - Initiate Non-Recurring Engineering (NRE) for migration of Airborne Sensors airframes to 2 newer platforms. The NRE phase leads to the acquisition of 1 replacement aircraft in FY 2018 and the acquisition of the 2nd aircraft in FY 2020. After modifications and testing, the first aircraft will be ready for MDA test support in FY 2020 and the second in FY 2021. - Conduct mandatory intermediate dry-dock of Pacific Collector (Sep18) and Pacific Tracker (Jun 18). - Develop a plan for converting Pacific Tracker's main propulsion system from burning heavy Intermediate Fuel Oil to burning much lighter marine diesel fuel. - Build control room for Transportable Telemetry Systems (TTS) on Pacific Tracker to move operations out of below-deck trailers. - Replace Sea Tel secondary C-Band SATCOM antennas onboard Pacific Tracker and Pacific Collector to address End of Life (EoL). - Support all BMDS Hardware-in-the-Loop ground testing conducted in FY 2018 with the full complement of HWIL test assets located at the ARC. 			
<p>Title: Engineering and Test Analysis</p> <p align="right">Articles:</p> <p>Description: The Engineering and Analysis effort provides essential BMDS ground and flight test event planning, execution, and evaluation activities for each test event: <ul style="list-style-type: none"> - Designing test architecture, defining test objectives and evaluation criteria, defining target requirements, and generating ground and flight test scenarios appropriate to the data collection requirements to assess BMDS performance and anchor Models and Simulations. - Producing the threat data for BMDS ground and flight tests. - Coordinating with BMDS OTA to address test issues, disposition them, coordinate them, with the OTA and recommend action plans to achieve closure. - Delivering HWIL M&S integration test cases. - Integrating, testing, functionally qualifying, and delivering end-to-end BMDS simulations supporting ground test missions. - Analyzing System-level interoperability. - Conducting modeling and technical analysis for Combatant Command wargames and exercises. - Utilizing M&S for pre-test assessment and post-test review, as well as M&S updates. - Providing test configuration management; risk assessments; and anomaly/deficiency review, assessment and closure. - Analyzing test results to identify verification and validation data collection shortfalls and reassigning objectives to future test events as required. - Documenting BMDS test observations for system-level test anomalies and coordinating the resulting BMDS Discrepancy Reports within the Failure Reporting, Analysis, and Corrective Action System (FRACAS) </p>	26.435 -	27.805 -	30.381 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>- Providing the Quick Look Brief, Mission Data Review (MDR), and Executive MDR. IMTP and infrastructure tasks include:</p> <ul style="list-style-type: none"> - Providing long-range BMDS IMTP planning and integration strategies related to overarching BMDS analysis product integration. - Upgrading test analysis tools in concert with the BMDS evolution (e.g., Modular Analysis and Reporting Suite (MARS)) to enhance analysis capability and efficiency. - Populating the MARS database with data from the most recently completed tests to support as-built analysis and capability assessments. - Providing engineering analysis process software to include System Coordination and Observation Reporting Environment (SCORE), Software Change Analysis Review Environment (SCARE), File Manager (FileMan), and ManPower Loading (MPL). - Incrementally improving and providing infrastructure, software, and MDA/IA compliance for the RApid Scenario Prototyping (RaSP) capability. <p>FY 2016 Accomplishments: Conducted the activities listed in the Description section above.</p> <p>FY 2017 Plans: FY 2017 increase keeps pace with projected FY 2017-FY 2021 IMTP events.</p> <ul style="list-style-type: none"> - Conduct the activities listed in the Description section above. - Validate test event data collection and conduct post-test analyses supporting delivery of Near-term Discrimination Improvements and Enhanced Homeland Defense capabilities. <p>FY 2018 Plans: FY 2018 decrease keeps pace with projected FY 2018-FY 2022 IMTP events.</p> <ul style="list-style-type: none"> - Conduct the activities listed in the Description section above. - Validate test event data collection and conduct post-test analyses supporting the EPAA Phase 3 Technical Capability Declaration. 			
Accomplishments/Planned Programs Subtotals	276.311	277.851	288.516

C. Other Program Funding Summary (\$ in Millions)										
Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To
			Base	OCO	Total					Complete
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing
										Continuing

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>

D. Acquisition Strategy

The BMDS Test Program acquisition strategy is consistent with the MDA capabilities-based acquisition strategy that emphasizes testing, evolutionary acquisition, and knowledge-based funding. Test directs a team of various internal staff (government and scientific, engineering and technical assistance support), executing agents (including DoD agencies, Service Organizations, Laboratories and Program Offices, Federally Funded Research and Development Center (FFRDC), and other MDA programs to execute the various diverse efforts within the BMDS test program through competition. When a specific effort/activity being conducted, acquired, or maintained requires the use of an executing agent, respective headquarter regulations are used to conform the acquisition strategy.

The MDA IMTP establishes and documents the test requirements for the BMDS with the specific focus on collecting the data needed for the Verification, Validation, and Accreditation (VV&A) of the BMDS Models and Simulations. This paradigm uses critical factor analysis to drive test design, planning, and execution for accrediting M&S, which is used to validate and assess system performance. With this test approach, MDA will establish confidence that the M&S used to evaluate the BMDS represent real world behavior, thereby enabling simulation-based performance assessment to verify system functionality.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Planning and Operations - IMTP Planning and Data Management Tools	C/FP	None : AL	88.212	21.012	Feb 2016	21.099	Oct 2016	21.723	Feb 2018	-		21.723	Continuing	Continuing	Continuing
Program Planning and Operations - Lab Analysis Infrastructure	MIPR	MIT-LL/Aerospace : AL/CA/MA	47.048	8.071	Feb 2016	7.053	Oct 2016	8.059	Feb 2018	-		8.059	Continuing	Continuing	Continuing
Program Planning and Operations - Operational Test Agency	MIPR	ATEC/Aberdeen Proving Grounds : MD	54.986	12.733	Feb 2016	12.536	Oct 2016	13.166	Feb 2018	-		13.166	Continuing	Continuing	Continuing
Program Planning and Operations - Support to Flight Testing	C/CPAF	Northrop Grumman/ Lockheed Martin : AL/CO	29.171	12.116	Oct 2015	12.009	Oct 2016	12.571	Oct 2017	-		12.571	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Planning and Operations - Support to Ground Testing	C/CPAF	MDIOC/JRDC/ Northrop Grumman : AL/CO/VA/DC	10.078	5.039	Oct 2015	5.011	Oct 2016	5.645	Oct 2017	-		5.645	Continuing	Continuing	Continuing
Program Planning and Operations - Support to Test Resources	C/CPAF	None : MiDAESS/AL	15.954	4.066	Oct 2015	4.176	Oct 2016	4.354	Oct 2017	-		4.354	Continuing	Continuing	Continuing
Program Planning and Operations - Test Functional Management Office	C/CPFF	None : MDA/ MiDAESS/AL/VA/ CO/MA	246.742	35.358	Mar 2016	35.896	Oct 2016	34.685	Mar 2018	-		34.685	Continuing	Continuing	Continuing
Flight Test - IMTP Flight Testing	MIPR	Air & Missile Def Command/AFGSC/ H'ville Operations Support Center/ NAWC/NRL/Ronald Reagan Test Site /SPAWAR/ Vandenberg AFB/ White Sands Missile Range/AMRDEC/ NSWC/PMRF/611th CES/611th ASUS/ AEDC : AL/CA/CO/ HI	209.706	25.906	Oct 2015	23.686	Oct 2016	16.194	Oct 2017	-		16.194	Continuing	Continuing	Continuing
Ground Test - IMTP Ground Testing	MIPR	Aviation & Missile Research & Development/LTPO/ Space & Naval Warfare Command : AL/CO/CA	40.585	2.277	Oct 2015	7.855	Oct 2016	10.102	Oct 2017	-		10.102	Continuing	Continuing	Continuing
Test Resources - Airborne Optics Mobile Assets	C/IDIQ	None : L3/JHU/APL/ TX/MD/AZ/TN	71.409	16.400	Feb 2016	15.355	Oct 2016	17.014	Feb 2018	-		17.014	Continuing	Continuing	Continuing
Test Resources - Core Ground Test Communication Support	MIPR	Space and Naval Warfare Command : AL/CA	15.772	4.127	Nov 2015	3.127	Oct 2016	3.908	Nov 2017	-		3.908	0	26.934	0

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Resources - Core Ground Test Labs and HWILS	C/IDIQ	None : Colsa/AMRDEC/AL/MD/FL/CA/OH/CO	114.781	26.457	Feb 2016	25.457	Oct 2016	28.675	Feb 2018	-		28.675	Continuing	Continuing	Continuing
Test Resources - Enhanced GT Capability Assets	C/IDIQ	None : Colsa/Boeing/NG/AL/CO/FL/MD/HI	19.748	8.080	Feb 2016	7.590	Oct 2016	7.759	Feb 2018	-		7.759	Continuing	Continuing	Continuing
Test Resources - Facilities Sustainment, Restoration & Modernization	MIPR	SMDC/Northrup Grumman/Colsa : AL/CO/NM	7.598	4.430	Nov 2015	4.144	Oct 2016	4.543	Nov 2017	-		4.543	Continuing	Continuing	Continuing
Test Resources - Flight Test Instrumentation	C/IDIQ	ASI/WSMR : Gray Research/NRL/NAWC/CA/MD/NCR/NM/AL/MA	70.471	12.413	Nov 2015	12.743	Oct 2016	12.751	Nov 2017	-		12.751	Continuing	Continuing	Continuing
Test Resources - Flight Test Ranges	C/IDIQ	SMDC/SNL/PMRF : NAWC/WSMR/AMRDEC/NG/AK/AL/CA/HI/NM/CO	58.274	11.056	Nov 2015	8.991	Oct 2016	11.862	Nov 2017	-		11.862	Continuing	Continuing	Continuing
Test Resources - Sea Based Mobile Assets	MIPR	None : MARAD/NAWC/Hanscom AFB/AL/CA/MD/NCR/NM/MA	56.016	12.411	Nov 2015	12.313	Oct 2016	12.528	Nov 2017	-		12.528	Continuing	Continuing	Continuing
Test Resources - Support to Test Resources	MIPR	None : MIDAESS/AL	92.809	21.951	Nov 2015	31.005	Oct 2016	32.596	Nov 2017	-		32.596	Continuing	Continuing	Continuing
Test Resources - Target ILS	MIPR	None : NSA/NAVSPECWARCOM/PMRF/RTC/SNL/YPG AL/CA/HI/NM	5.500	5.973	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering and Test Analysis - CSS Support	C/CPFF	Torch Technologies : AL	12.431	6.000		6.217	Nov 2016	4.079	Nov 2017	-		4.079	Continuing	Continuing	Continuing
Engineering and Test Analysis - FFRDA/UARC 2	MIPR	Aerospace : CA	0.000	0.755		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering and Test Analysis - FFRDC/UARC	MIPR	MITRE : VA	3.187	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Test Analysis - Industry Support - NME	C/CPAF	Northrop Grumman-JRDC : CO, AL	0.000	0.000		0.000		1.848	Nov 2017	-		1.848	Continuing	Continuing	Continuing
Engineering and Test Analysis - Industry Support	C/CPAF	Boeing : AL	17.469	2.569		2.409	Nov 2016	1.856	Nov 2017	-		1.856	Continuing	Continuing	Continuing
Engineering and Test Analysis - OGA Support	MIPR	AMRDEC : AL	37.874	17.111		16.618	Nov 2016	19.836	Nov 2017	-		19.836	Continuing	Continuing	Continuing
Engineering and Test Analysis - OGA Support - NME	MIPR	LTPO : AL	0.000	0.000		2.561	Nov 2016	2.762	Nov 2017	-		2.762	Continuing	Continuing	Continuing
Subtotal			1,325.821	276.311		277.851		288.516		-		288.516	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,325.821	276.311	277.851	288.516	-	288.516	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇									
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
FTP-10 (P8-4) (LTPO, Intercept Flight Test)	▲													
AA CTV-02 (FTO-02 E1a CTV) AEGIS AA, Intercept Only Flight Test)	▲													
ASD-15 (Intercept Flight Test)	◆													
FTP-14 E1 (P82A) (LTPO, Intercept Flight Test)	◆													
FTP-14 E2 (P82B) (LTPO, Intercept Flight Test)	◆													
SCD CTV-02 (AEGIS SCD, Intercept Only Flight Test)	▲													
Israeli Cooperative Intercept Flight Test (14A) - FY 2016	◆	◆	◆	◆										
Israeli Cooperative Intercept Flight Test - FY 2016	◆	◆	◆	◆										
FTP-09 (P8-3) (LTPO, Intercept Flight Test)	▲													
GM CTV-02 Plus (GM, Intercept Flight Test)	▲													
SM CTV-01 (AEGIS 3.6.1, Intercept Only Flight Test)	▲													
FTX-21 (AEG IS SBT, Target Only Flight Test)			◆											
GTI-06 Part 2 (BMDS Ground Test)			◆											
GTI-ISR (16) (BMDS Ground Test)			◆											
SM CTV-02 (AEGIS 3.6.1, Intercept Only Flight Test)			▲											
SM CTV-01a (AEGIS 3.6.1, Intercept Only Flight Test)			▲											
GTD-06 Part 2 (BMDS Ground Test)				◆										
FTM-27 (AEGIS SBT, Intercept Flight Test)					△									
Israeli Cooperative Intercept Flight Test - FY 2017					◇	◇	◇	◇						
SFTM-01 (AEGIS 5.1, Intercept Flight Test)						△								
Warfighter TP 06 (BMDS Ground Test)						◇								
FTX-30 (DT Tracking Exercise Flight Test)						△								
FTX-31 (DT Tracking Exercise Flight Test)						△								
FTT-18 (TH, Intercept Flight Test)							△							

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

	Significant Event Complete ▲			Milestone Decision Complete ★			Element Test Complete ◆			System Level Test Complete ●			Complete Activity ◆									
	Significant Event Planned △			Milestone Decision Planned ☆			Element Test Planned ◇			System Level Test Planned ○			Planned Activity ◇									
	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022			
FTT-15 (TH, Intercept Flight Test)						△																
FTG-15 (GM, Intercept Flight Test)						△																
SFTM-02 (AEGIS 5.1, Intercept Flight Test)						△																
FTP-11 (P8-0T2) (LTPO, Intercept Flight Test)						△																
FTP-12 (P8-0T3) (LTPO, Intercept Flight Test)						△																
FTX-32 (DT Tracking Exercise Flight Test)						△																
FTX-33 (DT Tracking Exercise Flight Test)						△																
FTX-34 (DT Tracking Exercise Flight Test)						△																
GTI-07a (BMDS Ground Test)						◇	◇															
FTP-13 (P8-0T4) (LTPO, Intercept Flight Test)						△																
GTD-07a (BMDS Ground Test)						◇																
FEV-01 (FTM-DST 1) (AEGIS 5.0, Intercept Flight Test)						△																
FS 17-1 (DT Tracking Exercise Flight Test)						△																
FTM-26 (AEGIS, Intercept Flight Test)						△																
FTM-27 (AEGIS, Intercept Flight Test)						△																
SM CTV-03 (AEGIS 3.6.1, Intercept Only Flight Test)						△																
FTM-29 (AEGIS 5.1, Intercept Flight Test)								△														
FE-1 (DT Tracking Exercise Flight Test)								△														
FS 17-2 (DT Tracking Exercise Flight Test)								△														
FS 17-4 (DT Tracking Exercise Flight Test)								△														
Israeli Cooperative Intercept Flight Test - FY 2018								◇	◇	◇	◇											
Warfighter TP 07a (BMDS Ground Test)								◇														
FTX-35 (TH, Target Only Flight Test)								△														
FTX-36 (TH, Patriot Target Only Flight Test)								△														

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
GTI-07b (E/C) (BMDS Ground Test)					◇	◇								
FT0-03 E1 (OTA, Intercept Flight Test)						△								
FTG-11 (IOT&E) (GM, Intercept Flight Test)							△							
JFTM-5 E1 (AEGIS 5.1, Intercept Flight Test)							△							
JFTM-5 E2 (AEGIS 5.1, Intercept Flight Test)							△							
GTD-07b (E/C) (BMDS Ground Test)							◇	◇						
FTM-31 (AEGIS SBT, Intercept Flight Test)								△						
GTI-07b (N/P) (BMDS Ground Test)								◇						
GTI-ISR (18) (BMDS Ground Test)								△						
Israeli Cooperative Intercept Flight Test - FY 2019								◇	◇	◇	◇			
FT0-03 E2 (OTA, Intercept Flight Test)								△						
FTP-17 (IBCS Intercept Flight Test)								△						
FTP-16 (IBCS Intercept Flight Test)								△						
FTM-32 (AEGIS SBT, Intercept Flight Test)									△					
FTM-33 (AEGIS SBT, Intercept Flight Test)									△					
GTD-07b (N/P) (BMDS Ground Test)									◇	◇				
FTX-23 (AEGIS 5.1, Target Only Flight Test)										△				
FEV-02 (FTM-DST 2) (AEGIS 5.0, Intercept Flight Test)										△				
FTX-27 (SN, Target Only Flight Test)										△				
GTI-08 (E/C) (BMDS Ground Test)										◇	◇			
Warfighter TP 07b (BMDS Ground Test)											◇			
GM CTV-03 (GM, Non-Intercept Flight Test)											△			
Israeli Cooperative Intercept Flight Test - FY 2020											◇	◇	◇	◇
FTP-18 (BCS Intercept Flight Test)												△		

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
FTP-19 (BCS Intercept Flight Test)										△				
FTP-20 (BCS Intercept Flight Test)										△				
JFTM-7 E1 (AEGIS 5.1, Intercept Flight Test)										△				
JFTM-7 E2 (AEGIS 5.1, Intercept Flight Test)										△				
GTI-08 (N/P)(BMDS Ground Test)										◇	◇			
FTT-19 (TH, Intercept Flight Test)										△				
FTM-24 (AEGIS 5.0, Intercept Flight Test)										△				
GTD-08 (E/C) (BMDS Ground Test)										◇	◇			
FTM-30 (AEGIS 5. 1, Intercept Flight Test)										△				
GTD-08 (N/P) (BMDS Ground Test)											◇			
GT-21 Sprint 1 (BMDS Ground Test)											◇			
FTG-17 (IOT&E) (GM, Intercept Flight Test)											△			
Israeli Cooperative Intercept Flight Test - FY 2021											◇	◇	◇	◇
Warfighter TP 08 (BMDS Ground Test)											◇			
GT-21 Sprint 2 (BMDS Ground Test)											◇			
GT-21 Sprint 3 (BMDS Ground Test)											◇	◇		
FTX-26 (SN, Target Only Flight Test)												△		
FTM-38 (AEGIS 5.0, Intercept Flight Test)												△		
GT-21 Sprint 4 (BMDS Ground Test)												◇		
GTI-ISR (21) (BMDS Ground Test)												◇		
FTT-21 (TH, Intercept Flight Test)													△	
GT-21 Sprint 5 (BMDS Ground Test)													◇	
GT-21 Sprint 6 (BMDS Ground Test)													◇	
FTG-18 (GM, Intercept Flight Test)														△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FTP-10 (P8-4) (LTPO, Intercept Flight Test)	1	2016	1	2016
AA CTV-02 (FTO-02 E1a CTV) AEGIS AA, Intercept Only Flight Test)	1	2016	1	2016
ASD-15 (Intercept Flight Test)	1	2016	1	2016
FTP-14 E1 (P82A) (LTPO, Intercept Flight Test)	1	2016	1	2016
FTP-14 E2 (P82B) (LTPO, Intercept Flight Test)	1	2016	1	2016
SCD CTV-02 (AEGIS SCD, Intercept Only Flight Test)	1	2016	1	2016
Israeli Cooperative Intercept Flight Test (14A) - FY 2016	1	2016	4	2016
Israeli Cooperative Intercept Flight Test - FY 2016	1	2016	4	2016
FTP-09 (P8-3) (LTPO, Intercept Flight Test)	2	2016	2	2016
GM CTV-02 Plus (GM, Intercept Flight Test)	2	2016	2	2016
SM CTV-01 (AEGIS 3.6.1, Intercept Only Flight Test)	2	2016	2	2016
FTX-21 (AEG IS SBT, Target Only Flight Test)	3	2016	3	2016
GTI-06 Part 2 (BMDS Ground Test)	3	2016	3	2016
GTI-ISR (16) (BMDS Ground Test)	3	2016	3	2016
SM CTV-02 (AEGIS 3.6.1, Intercept Only Flight Test)	3	2016	3	2016
SM CTV-01a (AEGIS 3.6.1, Intercept Only Flight Test)	3	2016	3	2016
GTD-06 Part 2 (BMDS Ground Test)	4	2016	4	2016
FTM-27 (AEGIS SBT, Intercept Flight Test)	1	2017	1	2017
Israeli Cooperative Intercept Flight Test - FY 2017	1	2017	4	2017
SFTM-01 (AEGIS 5.1, Intercept Flight Test)	2	2017	2	2017
Warfighter TP 06 (BMDS Ground Test)	2	2017	2	2017
FTX-30 (DT Tracking Exercise Flight Test)	2	2017	2	2017

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
FTX-31 (DT Tracking Exercise Flight Test)	2	2017	2	2017
FTT-18 (TH, Intercept Flight Test)	3	2017	3	2017
FTT-15 (TH, Intercept Flight Test)	3	2017	3	2017
FTG-15 (GM, Intercept Flight Test)	3	2017	3	2017
SFTM-02 (AEGIS 5.1, Intercept Flight Test)	3	2017	3	2017
FTP-11 (P8-0T2) (LTPO, Intercept Flight Test)	3	2017	3	2017
FTP-12 (P8-0T3) (LTPO, Intercept Flight Test)	3	2017	3	2017
FTX-32 (DT Tracking Exercise Flight Test)	3	2017	3	2017
FTX-33 (DT Tracking Exercise Flight Test)	3	2017	3	2017
FTX-34 (DT Tracking Exercise Flight Test)	3	2017	3	2017
GTI-07a (BMDS Ground Test)	3	2017	4	2017
FTP-13 (P8-0T4) (LTPO, Intercept Flight Test)	4	2017	4	2017
GTD-07a (BMDS Ground Test)	4	2017	4	2017
FEV-01 (FTM-DST 1) (AEGIS 5.0, Intercept Flight Test)	4	2017	4	2017
FS 17-1 (DT Tracking Exercise Flight Test)	4	2017	4	2017
FTM-26 (AEGIS, Intercept Flight Test)	4	2017	4	2017
FTM-27 (AEGIS, Intercept Flight Test)	4	2017	4	2017
SM CTV-03 (AEGIS 3.6.1, Intercept Only Flight Test)	4	2017	4	2017
FTM-29 (AEGIS 5.1, Intercept Flight Test)	1	2018	1	2018
FE-1 (DT Tracking Exercise Flight Test)	1	2018	1	2018
FS 17-2 (DT Tracking Exercise Flight Test)	1	2018	1	2018
FS 17-4 (DT Tracking Exercise Flight Test)	1	2018	1	2018
Israeli Cooperative Intercept Flight Test - FY 2018	1	2018	4	2018
Warfighter TP 07a (BMDS Ground Test)	2	2018	2	2018
FTX-35 (TH, Target Only Flight Test)	2	2018	2	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
FTX-36 (TH, Patriot Target Only Flight Test)	2	2018	2	2018
GTI-07b (E/C) (BMDS Ground Test)	2	2018	3	2018
FT0-03 E1 (OTA, Intercept Flight Test)	3	2018	3	2018
FTG-11 (IOT&E) (GM, Intercept Flight Test)	4	2018	4	2018
JFTM-5 E1 (AEGIS 5.1, Intercept Flight Test)	4	2018	4	2018
JFTM-5 E2 (AEGIS 5.1, Intercept Flight Test)	4	2018	4	2018
GTD-07b (E/C) (BMDS Ground Test)	4	2018	1	2019
FTM-31 (AEGIS SBT, Intercept Flight Test)	1	2019	1	2019
GTI-07b (N/P) (BMDS Ground Test)	1	2019	1	2019
GTI-ISR (18) (BMDS Ground Test)	1	2019	1	2019
Israeli Cooperative Intercept Flight Test - FY 2019	1	2019	4	2019
FT0-03 E2 (OTA, Intercept Flight Test)	2	2019	2	2019
FTP-17 (IBCS Intercept Flight Test)	2	2019	2	2019
FTP-16 (IBCS Intercept Flight Test)	2	2019	2	2019
FTM-32 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
FTM-33 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
GTD-07b (N/P) (BMDS Ground Test)	3	2019	4	2019
FTX-23 (AEGIS 5.1, Target Only Flight Test)	4	2019	4	2019
FEV-02 (FTM-DST 2) (AEGIS 5.0, Intercept Flight Test)	4	2019	4	2019
FTX-27 (SN, Target Only Flight Test)	4	2019	4	2019
GTI-08 (E/C) (BMDS Ground Test)	4	2019	1	2020
Warfighter TP 07b (BMDS Ground Test)	1	2020	1	2020
GM CTV-03 (GM, Non-Intercept Flight Test)	1	2020	1	2020
Israeli Cooperative Intercept Flight Test - FY 2020	1	2020	4	2020
FTP-18 (BCS Intercept Flight Test)	2	2020	2	2020

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
FTP-19 (BCS Intercept Flight Test)	2	2020	2	2020
FTP-20 (BCS Intercept Flight Test)	2	2020	2	2020
JFTM-7 E1 (AEGIS 5.1, Intercept Flight Test)	2	2020	2	2020
JFTM-7 E2 (AEGIS 5.1, Intercept Flight Test)	2	2020	2	2020
GTI-08 (N/P)(BMDS Ground Test)	2	2020	3	2020
FTT-19 (TH, Intercept Flight Test)	3	2020	3	2020
FTM-24 (AEGIS 5.0, Intercept Flight Test)	3	2020	3	2020
GTD-08 (E/C) (BMDS Ground Test)	3	2020	4	2020
FTM-30 (AEGIS 5. 1, Intercept Flight Test)	4	2020	4	2020
GTD-08 (N/P) (BMDS Ground Test)	1	2021	1	2021
GT-21 Sprint 1 (BMDS Ground Test)	1	2021	1	2021
FTG-17 (IOT&E) (GM, Intercept Flight Test)	1	2021	1	2021
Israeli Cooperative Intercept Flight Test - FY 2021	1	2021	4	2021
Warfighter TP 08 (BMDS Ground Test)	2	2021	2	2021
GT-21 Sprint 2 (BMDS Ground Test)	2	2021	2	2021
GT-21 Sprint 3 (BMDS Ground Test)	2	2021	3	2021
FTX-26 (SN, Target Only Flight Test)	3	2021	3	2021
FTM-38 (AEGIS 5.0, Intercept Flight Test)	3	2021	3	2021
GT-21 Sprint 4 (BMDS Ground Test)	3	2021	3	2021
GTI-ISR (21) (BMDS Ground Test)	3	2021	3	2021
FTT-21 (TH, Intercept Flight Test)	4	2021	4	2021
GT-21 Sprint 5 (BMDS Ground Test)	4	2021	4	2021
GT-21 Sprint 6 (BMDS Ground Test)	4	2021	4	2021
FTG-18 (GM, Intercept Flight Test)	1	2022	1	2022
GT-22 Sprint 1 (BMDS Ground Test)	1	2022	1	2022

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MT04 / <i>BMDS Test Program</i>
--	---	---

Events	Start		End	
	Quarter	Year	Quarter	Year
Israeli Cooperative Intercept Flight Test - FY 2022	1	2022	4	2022
GT-22 Sprint 2 (BMDS Ground Test)	2	2022	2	2022
GT-22 Sprint 3 (BMDS Ground Test)	2	2022	2	2022
FTM-35 (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
FTM-37 (IOT&E) (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
FTX-28 E1 (TH, Target Only Flight Test)	3	2022	3	2022
FTX-28 E2 (TH, Target Only Flight Test)	3	2022	3	2022
FTX-28 E3 (TH, Target Only Flight Test)	3	2022	3	2022
GT-22 Sprint 4 (BMDS Ground Test)	3	2022	3	2022
GTD-22 (E/C) (BMDS Ground Test)	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MC04 / <i>Cyber Operations</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC04: <i>Cyber Operations</i>	2.181	2.072	2.479	2.528	-	2.528	2.578	2.631	2.682	2.737	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The funds in this project sustain Missile Defense Agency DoD Information Assurance Certification and Accreditation Program (DIACAP), Risk Management Framework Standards, Computer Network Defense Service Provider and Controls Validation Testing activities; analysis of validation results; risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA Ballistic Missile Defense Test program. It maintains the Certification and Accreditation (C&A) data repository, capturing the DIACAP documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&M on all MDA information systems. This project supports the monitoring and tracking of Cybersecurity mitigations detailed in Information Technology security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior Information Assurance Officer/Certification Authority (CA) and DAA. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network / System Certification and Accreditation (C&A)	2.072	2.479	2.528
Articles:	-	-	-
Description: The BMDS Test Network/System Certification and Accreditation program will:			
<ul style="list-style-type: none"> - Provide cyber security Program oversight of all MDA Test Directorate (DT) information systems, networks, sponsored remote sites, ground and flight test infrastructure, and exercise/war game infrastructures. This includes management of: cyber security compliance and authorization; cyber security training and awareness; information system secure configuration; assessment and incident management; and computer network defense. - Fund Ballistic Missile Defense Test Program Information Assurance Manager (IAM) civilian salaries. - Conduct cyber security/information assurance engineering and architecture planning for the BMDS Test Program information technology systems. - Plan and test the Information Assurance controls for BMDS. - Develop DT NIST certification and accreditation packages. 			
FY 2016 Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MC04 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Conducted the Network/System Certification and Accreditation program as stated in the Description above.			
<i>FY 2017 Plans:</i> The increase is due to fluctuating contract pricing. -Continuation of the Network/System Certification and Accreditation program as stated in the Description above.			
<i>FY 2018 Plans:</i> Continuation of the Network/System Certification and Accreditation program as stated in the Description above.			
Accomplishments/Planned Programs Subtotals	2.072	2.479	2.528

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MC04 / <i>Cyber Operations</i>
--	---	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C&A) - Information Assurance	C/IDIQ	Torch Technologies : Various	1.719	1.756	Oct 2015	2.155		2.198	Oct 2017	-		2.198	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Information Assurance Civ	MIPR	MDA : Various	0.462	0.316	Oct 2015	0.324		0.330	Oct 2017	-		0.330	Continuing	Continuing	Continuing
Subtotal			2.181	2.072		2.479		2.528		-		2.528	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.181	2.072	2.479	2.528	-	2.528	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency							Date: May 2017									
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>				Project (Number/Name) MC04 / <i>Cyber Operations</i>								
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇							
				FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022						
MC04 Cyber Operations				◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MC04 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC04 Cyber Operations	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program Wide Support</i>	62.955	11.884	13.111	14.747	-	14.747	14.323	16.269	16.222	16.014	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 In FY 2016, FY 2017, and FY 2018 Program Wide Support reflects proportional changes as a result of budget changes to the Ballistic Missile Defense Test program. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	11.884	13.111	14.747
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	11.884	13.111	14.747

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	0.211	3.519		0.262	Jul 2017	0.295	Jul 2018	-		0.295	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	61.744	7.315	Dec 2015	12.849	Aug 2017	9.887	Aug 2018	-		9.887	Continuing	Continuing	Continuing
Program Wide Support - Facilities and Maintenance - SRM	MIPR	Various : Multi: AK,AL,CA,VA	1.000	1.050		0.000		4.565	Nov 2017	-		4.565	Continuing	Continuing	Continuing
Subtotal			62.955	11.884		13.111		14.747		-		14.747	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	62.955	11.884	13.111	14.747	-	14.747	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆		
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇		
					FY 2016	FY 2017
					FY 2018	FY 2019
					FY 2020	FY 2021
					FY 2022	
MD40 Program-Wide Support					◇◇◇◇◇	◇◇◇◇◇
					◇◇◇◇◇	◇◇◇◇◇
					◇◇◇◇◇	◇◇◇◇◇
					◇◇◇◇◇	◇◇◇◇◇
					◇◇◇◇◇	◇◇◇◇◇
					◇◇◇◇◇	◇◇◇◇◇
					◇◇◇◇◇	◇◇◇◇◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / <i>Ballistic Missile Defense Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1,744.951	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing
MC05: <i>Cyber Operations</i>	-	0.065	0.000	0.251	-	0.251	0.583	1.072	1.088	1.389	0	4.448
MT05: <i>BMDS Targets Program</i>	1,683.767	503.325	539.837	391.957	-	391.957	354.629	388.179	385.097	405.953	Continuing	Continuing
MD40: <i>Program Wide Support</i>	61.184	14.199	23.739	18.217	-	18.217	17.991	18.658	19.273	20.166	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

The decrease in FY2018 reflects re-phasing of funding for events in the BMDS Integrated Master Test Plan and includes reduced contract spending for Mission Support Services in accordance with Department Service Requirement Review Board reductions through increased competition.

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense System (BMDS) Targets Program provides centrally managed targets and countermeasures development and procurement for a cost effective, integrated system-level approach to BMDS testing. The Targets Program has realized past and future savings by centralized competition and management of targets and countermeasures using efficient acquisition strategies and lot buys resulting in economies of scale. Based on engineering assessments of threat intelligence data, the BMDS Targets Program develops, builds, and supports the launch of Short Range Ballistic Missile (SRBM: Less than 1000 Kilometer range) targets, Medium Range Ballistic Missile (MRBM: 1000-3000 Kilometer Range) targets, Intermediate Range Ballistic Missile (IRBM: 3000-5500 Kilometer Range) targets, Intercontinental Ballistic Missile (ICBM: Greater than 5500 Kilometer range) targets, and Multi-Class Components to test, verify, and validate the performance of the BMDS against threats. MDA's BMDS Targets Program provides an economical and reliable inventory of targets which are representative of feasible future threats and support demonstration of the capability of the evolving layered missile defense system in a simultaneous test and operations threat environment.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	527.563	563.576	471.059	-	471.059
Current President's Budget	517.589	563.576	410.425	-	410.425
Total Adjustments	-9.974	0.000	-60.634	-	-60.634
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-9.974	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	-60.634	-	-60.634

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>
---	--

Change Summary Explanation

The decrease in FY2018 from PB17 to PB18 reflects re-phasing of funding for events in the BMDS Integrated Master Test Plan and includes reduced contract spending for Mission Support Services in accordance with Department Service Requirement Review Board reductions through increased competition.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MC05 / <i>Cyber Operations</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC05: <i>Cyber Operations</i>	-	0.065	0.000	0.251	-	0.251	0.583	1.072	1.088	1.389	0	4.448
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project MC05 is the Defensive Cyber Operations Project established in this Program Element (PE) during PB 2018. Funds were previously reported in Project MT05 of this PE.

A. Mission Description and Budget Item Justification

The funds in this project sustain Missile Defense Agency DoD Information Assurance Certification and Accreditation Program (DIACAP), Risk Management Framework Standards, Computer Network Defense Service Provider and Controls Validation Testing activities; analysis of validation results; risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA Ballistic Missile Defense Test program. It maintains the Certification and Accreditation (C&A) data repository, capturing the DIACAP documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&M on all MDA information systems. This project supports the monitoring and tracking of Cybersecurity mitigations detailed in Information Technology security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior Information Assurance Officer/Certification Authority (CA) and DAA. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network / System Certification and Accreditation (C&A)	0.065	0.000	0.251
Articles:	-	-	-
Description: The Network/Systems Certification and Accreditation project sustains the MDA DoD Information Assurance Certification and Accreditation Program (DIACAP) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA Command and Control Battle Management and Communications (C2BMC) mission systems. It maintains the Certification and Accreditation (C&A) data repository, capturing the DIACAP documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority [DAA] accreditation decisions) and POA&M on all MDA information systems.			
FY 2016 Accomplishments:			
- Conducted cyber security and information assurance engineering and architecture planning for Targets technology systems			
- Planned and tested the information assurance controls for Targets systems			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MC05 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Developed Technology Maturation Initiatives DoD Information Assurance Certification and Accreditation Program certification and accreditation packages FY 2017 Plans: N/A FY 2018 Plans: See FY 2016 plans above.			
Accomplishments/Planned Programs Subtotals	0.065	0.000	0.251

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MC05 / <i>Cyber Operations</i>
--	--	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C&A) - Information Assurance 1	MIPR	Missile Defense Agency : Huntsville, AL	0.000	0.038	Oct 2015	0.000		0.121	Nov 2017	-		0.121	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Information Assurance 2	C/IDIQ	MiDAESS/TEAMS : Various	0.000	0.027	Nov 2015	0.000		0.130	Nov 2017	-		0.130	Continuing	Continuing	Continuing
Subtotal			0.000	0.065		0.000		0.251		-		0.251	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.065	0.000	0.251	-	0.251	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MC05 / <i>Cyber Operations</i>
--	--	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆															
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇															
					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td align="center">FY 2016</td> <td align="center">FY 2017</td> <td align="center">FY 2018</td> <td align="center">FY 2019</td> <td align="center">FY 2020</td> <td align="center">FY 2021</td> <td align="center">FY 2022</td> </tr> <tr> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> </tr> </table>	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇
FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022													
◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇													
MC05 Cyber Activities																			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MC05 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC05 Cyber Activities	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT05: <i>BMDS Targets Program</i>	1,683.767	503.325	539.837	391.957	-	391.957	354.629	388.179	385.097	405.953	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
The decrease in FY2018 from PB17 to PB18 reflects re-phasing of funding for events in the BMDS Integrated Master Test Plan and includes reduced contract spending for Mission Support Services in accordance with Department Service Requirement Review Board reductions through increased competition.

A. Mission Description and Budget Item Justification

The mission of the MDA BMDS Targets program is to provide an economical and reliable inventory of targets that are representative of feasible future threats. These targets enable demonstration of the evolving layered missile defense system capability in operationally realistic scenarios. The BMDS Targets Program develops and acquires three target types across four target classes. The classes include: Short Range Ballistic Missiles (SRBM), Medium Range Ballistic Missiles (MRBM), Intermediate Range Ballistic Missiles (IRBM), and Intercontinental Ballistic Missiles (ICBM). The target types (Type 1-3) designate the complexity of the target within its class. Type-1 targets are simple baseline configurations. Type-2 targets have increased capability or complexity. Type-3 targets have unique configurations.

The BMDS Targets Program develops and provides Modified Ballistic Re-Entry Vehicles (MBRV) and Countermeasures that can be used across the spectrum of target types and classes. The BMDS Targets Program provides target digital models that enable MDA weapon system program offices to simulate end to end sensor and interceptor performance during pre-mission analysis. The BMDS Targets Program also provides maintenance, aging surveillance, refurbishment, and routine testing of government furnished equipment boosters and target components.

The BMDS Targets Program carefully plans the year of execution to assure the best use of appropriated funds. However, the BMDS Targets Program must be flexible in its execution of the program in order to respond to emerging real world threats or changes in the intelligence community estimates of when a threat will be deployed. The Targets Program must also work with BMDS systems engineers on a continuing basis to align the targets program to the BMDS capabilities as reflected in MDA's Integrated Master Test Plan (IMTP). The BMDS Targets Program makes every effort to reduce instability in contracts, production base and budget while managing in this dynamic work environment.

The BMDS Targets Program develops and builds targets and countermeasures at multiple locations including: Courtland, AL; Orlando, FL; Huntsville, AL; and Chandler, AZ. Storage and maintenance facilities are also located throughout the country including: Huntsville, AL; White Sands, NM; Ogden, UT; Tooele, UT; Cape Canaveral Air Force Station, FL, and Courtland, AL.

The BMDS Targets Program consists of four major areas: Consumables, Program Planning and Operations, Resources, and Flight Test Execution.

<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>	FY 2016	FY 2017	FY 2018
Title: Consumables - Short Range Ballistic Missiles (SRBM)	31.109	29.956	9.168

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p align="right"><i>Articles:</i></p> <p>Description: Consumables include SRBM target hardware development and manufacturing.</p> <p>Target development includes non-recurring engineering, MBRVs, Countermeasures, and launch support equipment for BMDS flight testing. Target development provides air, sea, and ground launch capabilities to maximize flexibility in MDA test design. Development activities include requirements decomposition, design, modeling and simulation, qualification testing, and characterization. The BMDS Targets Program Office manages target configuration, component interface specifications, range integration, reliability, mission assurance, and costs. The BMDS Targets Program ensures target designs are producible, reliable, and affordable.</p> <p>Target manufacturing includes the build of targets and target components that are required to execute the BMDS IMTP. Manufacturing includes government furnished equipment and new component acquisition, assembly, and integration. Also included are target characterization, quality and mission assurance, transportation, and logistics support. The BMDS Targets Program delivers fully assembled and integrated targets to the BMDS Test Program. Future revisions to the IMTP will likely affect target types and quantities noted in the Planned Accomplishments.</p> <p>FY 2016 Accomplishments: -Aegis Readiness Assessment Vehicle-G (ARAV-G) - continued non-recurring engineering development efforts for booster hardware and the re-entry vehicle (RV) nose tip; initiated manufacturing of Ship Sets 1 and 2 to support pre-ship readiness reviews in FY 2017 (Ship Set 1) and FY 2018 (Ship Set 2) -Terrier, Terrier, Oriole-Extended Vehicle (TTO-E) - delivered Ship Set 1 to support pre-ship readiness review in FY 2016 and flight test in FY 2017; continued manufacturing of Ship Sets 3 and 4 to support pre-ship readiness reviews and flight tests in FY 2017 -Foreign Materiel Acquisition-1 (FMA-1) - delivered Ship Set 15 to support a flight test in FY 2016</p> <p>FY 2017 Plans: Decrease is due to the completion of non-recurring engineering efforts for the ARAV-G target.</p> <p>-Aegis Readiness Assessment Vehicle-G (ARAV-G) - deliver Ship Set 1 to support pre-ship readiness review and flight test in FY 2017, continue manufacturing of Ship Set 2 to support pre-ship readiness review and flight test in FY 2018 -Juno - continue non-recurring engineering development efforts; initiate hardware purchases for Ship Set 3 to support a pre-ship readiness review in FY 2018 and flight test in FY 2019</p>	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-Develop and manufacture additional SRBMs, MBRVs, and Countermeasures, as required by the BMDS IMTP</p> <p>FY 2018 Plans: Decrease is due to the final efforts related to the ARAV-G targets.</p> <p>Note: Because Aegis Readiness Assessment Vehicle (ARAV) targets are being used for additional programs beyond Aegis BMD, beginning in FY 2018, targets previously given the ARAV prefix will be renamed Short Range Ballistic Missile (SRBM) Type 4 (SRBM T4), with an identifier after the T4 to show specifically which type of target is being built. For example, former ARAV-G type targets will now be known as SRBM T4-G targets.</p> <p>-Short Range Ballistic Missile T4-G (SRBM T4-G) - continue manufacturing Ship Set 2 to support pre-ship readiness review and flight test in FY 2019</p> <p>-Initiate competitive award for future low-cost targets</p> <p>-Develop and manufacture additional SRBMs, MBRVs, and Countermeasures, as required by the BMDS IMTP</p>				
<p>Title: Consumables - Medium Range Ballistic Missiles (MRBM)</p> <p>Description: MRBM target hardware development and manufacturing is consistent with the Description found in the Consumables-SRBM section.</p> <p>Starting in FY 2017, Modified Ballistic Re-Entry Vehicle-7 (MBRV-7) efforts are being transferred to this section from the Consumables - Multi-Class section.</p> <p>FY 2016 Accomplishments:</p> <p>-MRBM Type 3 (MRBM T3) - delivered Ship Sets 3 and 4 to support pre-ship readiness reviews in FY 2016 and flight tests in FY 2016 (Ship Set 3) and FY 2017 (Ship Set 4); continued manufacturing of Ship Set 2 to support a pre-ship readiness review in FY 2017</p> <p>-MRBM Type 3 Configuration 2 (MRBM T3C2) - initiated non-recurring engineering design and development of MRBM T3C2; initiate manufacture of Ship Set 5 for delivery in FY 2018</p> <p>-Modified Ballistic Re-entry Vehicle-5 (MBRV-5) - implemented Phase II effort for MRBM T3/MBRV-5 Program; delivered Ship Sets 3 and 4 to support flight tests in FY 2016 (Ship Set 3) and FY 2017 (Ship Set 4); continued manufacturing of Ship Set 2 to support a flight test in FY 2018</p> <p>-MRBM T1/T2 - continued non-recurring engineering efforts; continued manufacturing of Ship Set 1 to support first target acceptance review and pre-ship readiness review in FY 2019; initiated long lead purchase and manufacture of Ship Sets 2-6 to</p>		123.349	138.654	99.952
		Articles:	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>support pre-ship readiness reviews in FY 2019 (Ship Set 2), FY 2021 (Ship Set 3), FY 2022 (Ship Set 4), and FY 2023 (Ship Sets 5 and 6)</p> <p>-Extended Long Range Air Launch Target (E-LRALT) - completed qualification testing and prepared Ship Set 2 for delivery to support a planned flight test in FY 2017</p> <p>FY 2017 Plans: Increase is due transfer of funds previously captured in the Consumables - Multi-Class section for the MRBM costs related to the Modified Ballistic Re-Entry Vehicle-7 (MBRV-7) effort and hardware purchases for the Medium Range Ballistic Missile T3C2.</p> <p>-MRBM Type 3 (MRBM T3) - deliver Ship Set 2 to support a pre-ship readiness review in FY 2017</p> <p>-MRBM Type 3 Configuration 2 (MRBM T3C2) - continue non-recurring engineering design and development of MRBM T3C2; continue manufacturing Ship Set 5 for delivery in FY 2018; initiate manufacturing of Ship Set 6 for delivery in FY 2019</p> <p>-MBRV-7 - continue manufacturing Ship Sets 6-9 (4 MBRVs) to support Flight Test Missions in FY 2018, FY 2020, and FY 2021; additional MBRV-7s are needed to meet IMTP requirements and the Government is competing the contract, the Request for Information (RFI) was released to the public in 2015</p> <p>-MRBM T1/T2 - continue non-recurring engineering efforts; continue manufacturing Ship Set 1 to support first target acceptance review in FY 2017 and pre-ship readiness review in FY 2019; continue manufacturing Ship Sets 2-6 to support pre-ship readiness reviews in FY 2020 (Ship Set 2), FY 2021 (Ship Sets 3 and 4), FY 2022 (Ship Set 5), and FY 2023 (Ship Set 6)</p> <p>-Extended Long Range Air Launch Target (E-LRALT) - deliver Ship Set 2 to support pre-ship readiness review and flight test in FY 2017</p> <p>-Develop and manufacture additional MRBMs, Re-Entry Vehicles, and Countermeasures, as required by the BMDS IMTP</p> <p>FY 2018 Plans: Decrease is due to reduced non-recurring engineering efforts for the MRBM T1/T2 and the MRBM T3C2 targets.</p> <p>-MRBM Type 3 Configuration 2 (MRBM T3C2) - continue non-recurring engineering design and development of MRBM T3C2; continue manufacturing of Ship Set 5 and 6 for delivery in FY 2018 (Ship Set 5) and FY 2019 (Ship Set 6) and flight tests in FY 2019</p> <p>-MBRV-7 - continue recurring engineering efforts; deliver MBRV-7 front section to support MRBM T1/T2 Ship Set 3; continue manufacturing MBRV-7 front sections to support MRBM T1/T2 Ship Sets 4-6</p> <p>-MRBM T1/T2 - continue non-recurring engineering efforts; continue manufacturing Ship Set 1 to support first target acceptance review and pre-ship readiness review in FY 2019; continue manufacturing of Ship Sets 2-6 to support pre-ship readiness reviews in FY 2019 (Ship Set 2), FY 2021 (Ship Set 3), FY 2022 (Ship Set 4), and FY 2023 (Ship Sets 5 and 6)</p> <p>-Competitively award effort for MRBM Countermeasure development and build.</p> <p>-Competitively award effort for MRBM Re-Entry Vehicle development and build.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

-Develop and manufacture additional MRBMs, Re-Entry Vehicles, and Countermeasures, as required by the BMDS IMTP

	FY 2016	FY 2017	FY 2018
Title: Consumables - Intermediate Range Ballistic Missiles (IRBM)	102.330	141.986	68.559
Articles:	-	-	-

Description: IRBM target hardware development and manufacturing is consistent with the Description found in the Consumables-SRBM section.

Starting in FY 2017, Modified Ballistic Re-Entry Vehicle-8 (MBRV-8), MBRV-8 Characterization, and Countermeasures efforts associated with the IRBM are being transferred to this section from the Consumables - Multi-Class section.

FY 2016 Accomplishments:

-IRBM T1/T2 - delivered Ship Set 4 to support pre-ship readiness review in FY 2016; continued manufacturing and integration of Ship Sets 2 and 5-14 to support pre-ship readiness reviews in FY 2017 (Ship Sets 2 and 5), FY 2018 (Ship Sets 6-9), FY 2019 (Ship Sets 10-12), and FY 2021 (Ship Set 13 and 14); initiated production of Ship Sets 15-16 to support pre-ship readiness reviews in FY 2021

FY 2017 Plans:

Increase is due to transfer of funds previously captured in the Consumables - Multi-Class section for the IRBM costs related to the MBRV-8, MBRV-8 Characterization, and Countermeasures efforts. Additionally, FY 2017 hardware purchases for IRBM T1/T2 Ship Sets 13-16 contributed to the increase over FY 2016.

-IRBM T1/T2 - deliver Ship Sets 2 and 5 to support pre-ship readiness reviews and flight tests in FY 2017; continue manufacturing and integration of Ship Sets 6-16 to support pre-ship readiness reviews in FY 2018 (Ship Sets 6-9), FY 2019 (Ship Sets 10-13), FY 2020 (Ship Set 14), and FY 2021 (Ship Sets 15 and 16)

-MBRV-8 - deliver Ship Set 2 to support a flight test in FY 2017 and continue manufacturing Ship Sets 4-7 to support flight tests in FY 2018; perform additional characterization on the MBRV-8

-Develop and manufacture additional IRBMs, Re-Entry Vehicles, and Countermeasures, as required by the BMDS IMTP

FY 2018 Plans:

Decrease is due to major hardware purchases being completed in FY 2017.

-IRBM T1/T2 - deliver Ship Sets 6 and 7 to support flight tests in FY 2018; deliver Ship Sets 8 and 9 to support flight tests in FY 2019; continue manufacturing and integration of Ship Sets 10-16 to support pre-ship readiness reviews in FY 2020 (Ship Sets 10 and 11), FY 2021 (Ship Sets 12), FY 2022 (Ship Sets 13 and 14), and FY 2023 (Ship Sets 15 and 16)

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-MBRV-8 - deliver Ship Sets 4 and 5 to support flight tests in FY 2018; deliver Ship Sets 6 and 7 to support flight tests in FY 2019; perform additional characterization on the MBRV-8</p> <p>-Competitively award effort for IRBM Countermeasures</p> <p>-Competitively award effort for IRBM aeroshells</p> <p>-Develop and manufacture additional IRBMs, Re-Entry Vehicles, and Countermeasures, as required by the BMDS IMTP</p>				
<p>Title: Consumables - Intercontinental Ballistic Missiles (ICBM)</p> <p align="right">Articles:</p> <p>Description: ICBM target hardware development and manufacturing is consistent with the Description found in the Consumables-SRBM section.</p> <p>Starting in FY 2017, MBRV-8, MBRV-8 Characterization, and Countermeasures efforts associated with the ICBM are being transferred to this section from the Consumables - Multi-Class section.</p> <p>FY 2016 Accomplishments:</p> <p>-ICBM T1/T2 - delivered Ship Set 1 for first flight test currently scheduled in the Integrated Master Test Plan for second quarter FY 2017 and delivered Ship Set 2 to support pre-ship readiness review in FY 2017 for fight test in FY 2018</p> <p>-Continued integration of the ICBM Ground Test Missile</p> <p>-Conducted Pathfinder Operation at Reagan Test Site in preparation for the first ICBM flight test</p> <p>FY 2017 Plans:</p> <p>Increase is due transfer of funds previously captured in the Consumables - Multi-Class section for the ICBM costs related to the MBRV-8, MBRV-8 Characterization, and Countermeasures efforts.</p> <p>-ICBM T1/T2 - continue manufacturing Ship Set 3 to support pre-ship readiness review in FY 2020; initiate manufacturing of Ship Set 4 and 5 to support pre-ship readiness reviews in FY 2021 and FY 2022</p> <p>-MBRV-8 - deliver Ship Set 3 to support a flight test in FY 2017; continue manufacturing Ship Set 8 to support a flight test in FY 2019; perform additional characterization on the MBRV-8</p> <p>-Continue integration of the ICBM Ground Test Missile used as a pathfinder for the Concept of Operations</p> <p>-Develop and manufacture additional ICBMs, Re-Entry Vehicles, and Countermeasures, as required by the BMDS IMTP</p> <p>FY 2018 Plans:</p> <p>Decrease is due to reduced hardware purchases in FY 2018.</p>		42.264	63.414	52.843
		-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-ICBM T1/T2 - continue manufacturing Ship Set 3, 4, and 5 to support pre-ship readiness reviews in FY 2021 (Ship Set 3), FY 2022 (Ship Set 4), and FY 2023 (Ship Set 5)</p> <p>-MBRV-8 - continue performing characterization on the MBRV-8</p> <p>-Continue integration of the ICBM Ground Test Missile used as a pathfinder for the Concept of Operations</p> <p>-Competitively award ICBM T2CU effort</p> <p>-Develop and manufacture additional ICBMs, Re-Entry Vehicles, and Countermeasures, as required by the BMDS IMTP</p>				
<p>Title: Consumables - Multi-Class</p> <p align="right">Articles:</p> <p>Description: Multi-Class hardware development and manufacturing is consistent with the Description found in the Consumables-SRBM section.</p> <p>FY 2016 Accomplishments:</p> <p>-Modified Ballistic Re-Entry Vehicle-7 (MBRV-7) - continued manufacturing of Ship Sets 6-7 to support flight tests in FY 2018 and FY 2019; initiated production of Ship Sets 8 and 9 to support flight tests in FY 2019 and FY 2020</p> <p>-MBRV-8 - continued manufacturing of Ship Sets 3 and 4 to support flight tests in FY 2017 (Ship Set 3) and FY 2018 (Ship Set 4); initiated production of Ship Sets 5-8 to support flight tests in FY 2018</p> <p>FY 2017 Plans:</p> <p>Beginning in FY 2017, funds previously associated with this R2A Accomplishment are captured in the specific target class they support.</p> <p>-MBRV-7 efforts have been transferred to Consumables - Medium Range Ballistic Missiles (MRBM)</p> <p>-MBRV-8 and MBRV-8 Characterization efforts have been transferred to Consumables - Intermediate Range Ballistic Missiles (IRBM) and Intercontinental Ballistic Missiles (ICBM)</p> <p>-Countermeasures efforts have been transferred to Consumables - Intermediate Range Ballistic Missiles (IRBM) and Intercontinental Ballistic Missiles (ICBM)</p> <p>FY 2018 Plans:</p> <p>See FY 2017 explanation.</p>		59.224	0.000	0.000
		-	-	-
<p>Title: Program Planning & Operations</p> <p align="right">Articles:</p> <p>Description: Program Planning and Operations provides for government management of the Targets program. Included in this effort is program and business management, program administration, technical and testing oversight, verification of hardware and</p>		63.188	67.373	68.111
		-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>software development, government manpower and infrastructure to develop, test and sustain the BMDS Targets Program Office system and components. Other Government Agency and Federally Funded Research and Development Research Centers are used for highly specialized skill sets not available internal to Targets for specific time periods. Specific yearly accomplishments include the following:</p> <ul style="list-style-type: none"> -Provide technical and business management support activities, financial management, cost and schedule performance analysis cost estimation and analysis, and integration activities -Provide program management, subcontract management, quality assurance, verification of hardware and software development, and technical and testing oversight -Ensure Targets and Countermeasures program compliance with internal and external direction, policies, and regulations -Conduct Internal Program Plans that align with the MDA approved IMTP -Provide program and technical management of target launch operations activities to include oversight of mission planning, range coordination, and mission requirements <p>FY 2016 Accomplishments: See above.</p> <p>FY 2017 Plans: Increase over FY 2016 is due to the addition of cost sharing for Information Technology (IT) services such as end user support, portal and data services, business automation, and IT consumables.</p> <p>See above, with addition of the following:</p> <ul style="list-style-type: none"> -Provide information technology services to support management of the Targets program <p>FY 2018 Plans: See FY2017 Plans above.</p>				
<p>Title: Resources</p> <p align="right">Articles:</p> <p>Description: BMDS Target Resources consist of two sub-elements: Systems Engineering/Program Management and Logistics.</p> <p>Systems Engineering/Program Management provides technical direction to meet Target Program requirements while balancing cost, schedule, performance, and risk. It conducts functional requirements allocation to product lines, defines product line specifications/interfaces, performs configuration and data management, and follows guidelines for design reviews. It performs</p>		59.474 -	57.836 -	56.245 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>target system analysis to verify system performance, defines target program baselines, controls flight test configurations, and conducts pre and post-flight analysis. It identifies treaty and environmental issues and develops plans for issue resolution. It provides Quality, Safety, and Mission Assurance operations to ensure compliance with Missile Defense Agency requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered for test events. It also includes Single Stimulation Framework (SSF)/Objective Simulation Framework (OSF) compatible Modeling and Simulation execution and improvements to evolve TC Modeling and Simulation capability; trajectory analyses; signature analyses and characterization; studies to assess alternative target and platform solutions; assessments of risk management; and design approval of government furnished equipment. Specific Systems Engineering Planned Accomplishments include:</p> <ul style="list-style-type: none"> -Continue Program Management and Business Operations for target components to provide a framework for overall management of the Targets program -Continue providing classified network connections to Other Government Agencies (OGAs) so their subject matter experts can be used to support Target requirements -Continue analyses of future target Launch Vehicles, Re-Entry Vehicles, and launch platforms to ensure they are threat representative and that the Agency is making use of available technology in our future designs -Continue performing Pedigree Reviews to ensure high probability of mission success -Continue information technology and classified network support to ensure sensitive target information is not compromised -Continue Software Independent Verification and Validation (IV&V) to provide risk reduction of flight missions for target systems under development, including the Intermediate Range Ballistic Missile (IRBM) and Modified Ballistic Re-Entry Vehicle-5 (MBRV-5) <p>BMDS Targets Program Logistics support provides target storage, aging surveillance, and transportation of TC hardware in support of BMDS testing. Also included are integrated logistics support for facilities, inventory maintenance, spare parts, aging surveillance, disposal, special testing for rocket motor propellants, and other hazardous material handling. This task manages and oversees accountability of all government furnished equipment and contractor acquired property. Logistics also provides common support equipment for launch vehicles, MBRVs, countermeasures, and all up integrated target rounds. It also supports launch site activations through the transportation of support equipment to various test sites. Specific Targets Logistics Planned Accomplishments include:</p> <ul style="list-style-type: none"> -Continue Multi-Class Inventory storage, aging surveillance, maintenance of existing assets, and transportation support that ensured availability of Modified Ballistic Re-entry Vehicles and ground support equipment -Conduct disposal actions of inert assets <p><i>FY 2016 Accomplishments:</i></p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
See above.				
FY 2017 Plans: Decrease in FY 2017 due to Target Resource requirements for the mix of flight tests planned.				
See above.				
FY 2018 Plans: See above.				
Title: Flight Test Execution		22.387	40.618	37.079
		Articles:	-	-
<p>Description: Flight Test Execution is performed by the Target Launch Operations group. This group conducts target mission planning, coordinates target range and mission requirements, and provides target technical information to the Missile Defense Agency's General Counsel to support treaty approvals. The Target Launch Operations Group is the primary link between the target developer and the Ballistic Missile Defense System test community, incorporating target system constraints into the BMDS mission countdown and launch constraints.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Conducted a Ground-Based Midcourse Defense (GMD) 3-stage Capability Enhancement II (CE-II) interceptor characterization test with an air-launched Intermediate Range Ballistic Missile (IRBM) target -Conducted a Ground-Based Midcourse Defense (GMD) 3-stage CE-II Configuration 2 (C2)/Consolidated Booster Avionics Upgrade (CBAU) CE-II Blk I Exoatmospheric Kill Vehicle (EKV) Ground-Based Interceptor engagement of a InterContinental Ballistic Missile (ICBM) target -Conducted an Aegis BMD Baseline 9.C2 (5.1) SM-3 Blk IIA missile simulated engagement of a Medium Range Ballistic Missile (MRBM) target -Conducted an Aegis BMD Baseline 9.C2 (5.1) SM-3 Blk IIA missile engagement of a Medium Range Ballistic Missile (MRBM) target -Conducted target test engineering, mission logistics, and launch operations with consistent test expertise to support operational and developmental flight testing across the Ballistic Missile Defense System Targets Program in accordance with the Integrated Master Test Plan (IMTP) in various test Major Range and Test Facilities (MRTF). -Conducted mission planning and range coordination activities, perform final target system integration and execute target missions, provided communications security equipment and management for Ballistic Missile Defense System Flight Test events <p>FY 2017 Plans: Increase from FY 2016 due to mix of flight tests in the Agency's Integrated Master Test Plan.</p>				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDs Targets Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>--Conduct final target integration with the test range and accomplish launch operations of an ICBM target (First Flight Target) in support of a Ground-Based Midcourse Defense (GMD) 3-stage CE-II Configuration 2 (C2)/Consolidated Booster Avionics Upgrade (CBAU) CE-II Blk I Exoatmospheric Kill Vehicle (EKV) Ground-Based Interceptor engagement</p> <p>Conduct final target integration with the test range and accomplish launch operations of an ICBM target in support of a GMD salvo engagement of a 3-stage Heritage CE-II and a 3-stage Heritage CE-I GBI</p> <p>-Conduct final target integration with the test range and accomplish launch operations of a MRBM target in support of an Aegis BMD Baseline 9.C1 SM-6 Dual Interceptor salvo engagement</p> <p>-Conduct final target integration with the test range and accomplish launch operations of a MRBM target in support of an Aegis BMD SM-3 Launch on Remote engagement</p> <p>-Conduct final target integration with the test range and accomplish launch operations of a MRBM target in support of an Aegis BMD Baseline 9.C2 SM-3 Block IIA engagement</p> <p>-Conduct final target integration with the test range and accomplish launch operations of one MRBM target and one SRBM target in support of a THAAD TH3.0.0 endo-atmospheric engagement</p> <p>-Conduct final target integration with the test range and accomplish launch operations of an air launched IRBM target in support of GMD simulated engagement through Weapons Task Plan (WTP)</p> <p>-Conduct final target integration with the test range and accomplish launch operations of a SRBM target in support of an Aegis BMD Baseline 9.C2 simulated engagement</p> <p>-Conduct final target integration with the test range and accomplish launch operations of a SRBM target in support of an Aegis BMD Baseline 9.C2 SM-6 Dual Interceptor engagement</p> <p>-Conduct target test engineering and launch operations with consistent test expertise to support operational and developmental flight testing across the BMDs Targets Program in accordance with the IMTP in various test Major Range and Test Facilities (MRTF).</p> <p>-Conduct mission planning and range coordination activities, perform final target system integration and execute target missions, provided communications security equipment and management for Ballistic Missile Defense System Flight Test events</p> <p>FY 2018 Plans: Decrease is due to fewer flight tests in the Agency's Integrated Master Test Plan for FY 2018.</p> <p>-Conduct final target integration with the test range and accomplish launch operations of an ICBM target in support of Ground-Based Midcourse Defense (GMD) Initial Operational Test and Evaluation (IOT&E) demonstrating a salvo (2) engagement firing two 3-stage C1 Heritage Ground Based Interceptors with CE-I and CE-I Exo-atmospheric Kill Vehicles (EKV)</p> <p>-Conduct final target integration with the test range and accomplish launch operations of an IRBM target in support of an Aegis BMD Baseline 9.C2 SM-3 Blk IIA Engage on Remote (AN/TPY-2 Forward Based Mode)</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-Conduct final target integration with the test range and accomplish launch operations of two IRBM targets in support of an operational engagement using European Phased Adaptive Approach (EPAA) Phase 3 architecture -Conduct initial planning and final target integration with the test range and forward staging area in support of Two IRBM targets and one MRBM target in support of a BMDS Integrated Operational Test engagement using regional/theater architecture -Conduct final target integration with the test range and accomplish launch operations of Short Range Ballistic Missile (SRBM) target in support of Aegis BMD SM-6 Dual II (simultaneous engagement with AAW)			
Accomplishments/Planned Programs Subtotals	503.325	539.837	391.957

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The MDA BMDS Targets Program provides for the development and purchase of ballistic missile targets and countermeasures for the BMDS in support of the MDA's flight test program. The BMDS Targets Program requirements are derived from the BMDS Integrated Master Test Plan (IMTP).

The BMDS Targets and Countermeasures Program Acquisition Strategy is based on three premises. The first is to utilize existing capabilities. The second is to initiate new development if there is no existing capability using firm-fixed price contracts with incentive fee based on cost, schedule and performance. The third premise is to use cost reimbursable contracts with incentive fee based on cost, schedule, and performance for new development that has high-risk.

MDA BMDS Targets Program competitively awarded a prime contract to Orbital Sciences Corporation air-launched IRBM targets. This award included two follow-on options; one for eight IRBM targets (exercised) and another for one to six IRBM targets.

MDA BMDS Targets Program conducted a limited competition and awarded a contract modification to Orbital Sciences Corporation for development of ICBM targets. This award included two ICBM Stage Zero Kits to be used with an existing air-launched IRBM target.

The United States Air Force transferred the L-3 Communications/Coleman Aerospace Corporation contract for one air-launched medium range ballistic missile and one air-launched short range ballistic missile to MDA in FY 2013.

MDA BMDS Targets Program competitively awarded a prime contract to L-3 Communications/Coleman Aerospace Corporation to provide 6 MRBM targets. This award includes one follow-on option, for up to twelve additional MRBM targets.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

The Aegis Readiness Assessment Vehicle (ARAV) target effort is managed by MDA BMDS Targets Program and the Naval Surface Warfare Center Port Hueneme Division White Sands (NSWC PHD WS). NSWC PHD WS has unique sounding rocket expertise and access to existing contracts managed by White Sands Missile Range that makes this a beneficial relationship for both parties. MDA BMDS Targets Program provides targets funding via Military Interdepartmental Purchase Orders that NSWC PHD WS expends on its hardware development and engineering contracts.

MDA BMDS Targets Program is currently in various stages of planning or execution for procurement of ballistic missile targets by range class: SRBM, MRBM, IRBM, and ICBM. These targets will be procured using a Target Performance Specification to support flight test requirements as identified in the IMTP. Each target class will be solicited, evaluated, and competitively awarded independently in IMTP "need date" priority order.

Within each target class, capabilities are further segregated and designated as a class type. Type 1, Type 2, and Type 3 capabilities are defined as follows:

Type 1: A Type 1 target is the baseline (simple) configuration for the class. A Type 1 target satisfies the minimum target requirements to provide the baseline capability for each target class. The baseline configuration represents the complete vehicle stack-up and includes: 1-n boosters, attitude control system, test object, flight termination system, housekeeping and environmental instrumentation, and telemetry. For example, the basic configuration of an LV-2 target is representative of a Type 1 configuration in the intermediate range class.

Type 2: A Type 2 target requires more advanced or complex performance capabilities. Type 2 capabilities may be included in the baseline Type 1 configuration or provided as configuration kits that can be added to the baseline configuration. Type 2 kits may include the following: countermeasures and associated deployment capability, enhanced targeting and aim point accuracies, selectable booster and test object dynamics, tailored separation debris, temperature sensors, hit location and miss distance instrumentation, onboard sensors, deployable fly along sensors, and/or lethality payloads. For example, the LV-2 target with countermeasures or additional payloads is representative of a Type 2 configuration in the intermediate range class.

Type 3: A Type 3 target is a unique configuration procured in low unit quantities. Type 3 targets encompass unique threat characteristics or test conditions (i.e. Ground Based Midcourse Defense high velocity engagement scenario) not achievable with a Type 1 or Type 2 configuration.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Consumables - Short Range Ballistic Missiles (SRBM) - 1	C/CPAF	L3 Communications/ Coleman Aerospace : Orlando, FL	27.641	2.616	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Short Range Ballistic Missiles (SRBM) - 2	MIPR	Naval Surface Warfare Center, Port Hueneme : Port Hueneme, CA	30.356	25.743	Nov 2015	10.168	Nov 2016	5.316	Nov 2017	-		5.316	Continuing	Continuing	Continuing
Consumables - Short Range Ballistic Missiles (SRBM) - 6	C/CPAF	Juno Target : TBD	0.000	2.750	Jul 2016	19.788	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Short Range Ballistic Missiles (SRBM) - 7	C/CPAF	Lockheed Martin Space Systems Company : Courtland, AL	20.965	0.000		0.000		1.014	Nov 2017	-		1.014	0	21.979	20.965
Consumables - Short Range Ballistic Missiles (SRBM) - 8	C/CPAF	Future Low Cost Target : TBD	0.000	0.000		0.000		2.838	Mar 2018	-		2.838	0	2.838	4.192
Consumables - Medium Range Ballistic Missiles (MRBM) - 1	C/CPAF	Lockheed Martin Space Systems Company : Courtland, AL	379.167	38.580	Nov 2015	19.133	Nov 2016	22.879	Nov 2017	-		22.879	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 10	C/CPAF	Orbital Sciences Corporation : Chandler, AZ	0.000	0.000		0.000		22.517	Nov 2017	-		22.517	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 11	MIPR	Naval Surface Warfare Center : Crane, IN	0.000	0.000		0.000		0.278	Dec 2017	-		0.278	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 12	C/CPAF	Future MRBM Countermeasures : TBD	0.000	0.000		0.000		11.099	Jun 2018	-		11.099	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 13	C/CPAF	Future MRBM RFP : TBD	0.000	0.000		0.000		10.367	Jun 2018	-		10.367	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
0400 / 4				PE 0603915C / Ballistic Missile Defense Targets				MT05 / BMDS Targets Program							
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Consumables - Medium Range Ballistic Missiles (MRBM) - 14	C/CPAF	Future MRBM RV RFP : TBD	0.000	0.000		0.000		13.300	Mar 2018	-		13.300	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 2	C/CPAF	L3 Communications/ Coleman Aerospace : Orlando, FL	116.411	60.726	Nov 2015	37.355	Nov 2016	19.397	Nov 2017	-		19.397	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 3	MIPR	Naval Surface Warfare Center, Dahlgren Division : Dahlgren, VA	0.362	0.119	Nov 2015	0.058	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 5	MIPR	White Sands Missile Range : White Sands, NM	0.016	0.380	Nov 2015	0.184	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 6	MIPR	Pacific Missile Range Facility : Barking Sands, HI	0.009	0.208	Nov 2015	0.101	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 7	MIPR	Space and Missile Defense Command : Huntsville, AL	0.740	1.078	Nov 2015	0.000		0.115	Dec 2017	-		0.115	0	1.933	0
Consumables - Medium Range Ballistic Missiles (MRBM) - 8	C/CPAF	MRBM RFP : TBD	4.992	22.258	Nov 2015	81.792	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 9	MIPR	Defense Information Systems Agency : Fort Meade, MD	0.000	0.000		0.031	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 1	C/CPAF	Orbital Sciences Corporation : Chandler, AZ	321.664	102.330	Nov 2015	97.438	Nov 2016	38.784	Nov 2017	-		38.784	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 10	C/CPFF	Orbital/Alliant Techsystems : Magna, UT	0.000	0.000		0.000		3.842	Nov 2017	-		3.842	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
0400 / 4				PE 0603915C / Ballistic Missile Defense Targets				MT05 / BMDS Targets Program							
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 11	MIPR	Defense Finance and Accounting Services : Indianapolis, IN	0.000	0.000		0.000		0.341	Oct 2017	-		0.341	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 12	MIPR	Naval Air Weapons Station : China Lake, CA	0.000	0.000		0.000		0.759	Dec 2017	-		0.759	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 13	MIPR	Redstone Garrison : Huntsville, AL	0.000	0.000		0.000		0.040	Dec 2017	-		0.040	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 14	MIPR	Air Force Research Laboratory : Wright Patterson AFB, OH	0.000	0.000		0.000		0.055	Dec 2017	-		0.055	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 4	C/CPAF	Lockheed Martin Space Systems Company : Courtland, AL	27.417	0.000		16.598	Nov 2016	1.951	Nov 2017	-		1.951	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 5	C/CPAF	Lockheed Martin Space Systems Company : United Kingdom	0.000	0.000		9.390	Nov 2016	0.882	Nov 2017	-		0.882	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 6	C/CPAF	Countermeasures RFP : TBD	0.000	0.000		3.709	Nov 2016	8.108	Jun 2018	-		8.108	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 7	C/CPAF	MBRV-8 Characterization RFP : TBD	0.000	0.000		4.690	Nov 2016	9.018	Jul 2018	-		9.018	Continuing	Continuing	Continuing
Consumables - Intermediate Range	MIPR	US Army Garrison - Natick : Natick, MA	0.000	0.000		0.036	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
0400 / 4				PE 0603915C / Ballistic Missile Defense Targets				MT05 / BMDS Targets Program							
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ballistic Missiles (IRBM) - 8															
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 9	C/CPAF	Future MBRV RFP : TBD	0.000	0.000		10.125	Nov 2016	4.779	Jul 2018	-		4.779	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 1	C/CPAF	Orbital Sciences Corporation : Chandler, AZ	131.377	32.335	Nov 2015	26.823	Nov 2016	27.902	Nov 2017	-		27.902	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 10	C/CPAF	Lockheed Martin Space Systems Company : Courtland, AL	0.000	0.000		11.848	Nov 2016	0.206	Nov 2017	-		0.206	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 11	FFRDC	Massachusetts Institute of Technology, Lincoln Labs : Lexington, MA	0.000	0.000		11.172	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 12	C/CPAF	MBRV-X RFP : TBD	0.000	0.000		9.690	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 13	C/CPAF	Lockheed Martin Space Systems Company : United Kingdom	0.000	0.000		0.000		3.363	Nov 2017	-		3.363	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 14	MIPR	Air Force Research Laboratory : Wright Patterson AFB, OH	0.000	0.000		0.000		0.055	Dec 2017	-		0.055	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 15	C/CPAF	ICBM T3C2 RFP : TBD	0.000	0.000		0.000		12.223	Jun 2018	-		12.223	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 16	C/CPAF	Future MBRV RFP : TBD	0.000	0.000		0.000		9.018	Jul 2018	-		9.018	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Consumables - Intercontinental Ballistic Missiles (ICBM) - 2	C/CPFF	Alliant Techsystems : Magna, UT	3.688	3.771	Nov 2015	3.801	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 3	MIPR	Defense Financial and Accounting Service : Indianapolis, IN	0.000	2.656	Nov 2015	0.000		0.000		-		0.000	0	2.656	0
Consumables - Intercontinental Ballistic Missiles (ICBM) - 4	MIPR	Naval Air Weapons Station : China Lake, CA	0.077	0.448	Nov 2015	0.080	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 5	MIPR	Naval Surface Warfare Center, Dahlgren Division : Dahlgren, VA	0.000	0.071	Nov 2015	0.000		0.076	Dec 2017	-		0.076	0	0.147	0
Consumables - Intercontinental Ballistic Missiles (ICBM) - 6	MIPR	Pacific Missile Range Facility : Barking Sands, HI	0.000	0.107	Nov 2015	0.000		0.000		-		0.000	0	0.107	0
Consumables - Intercontinental Ballistic Missiles (ICBM) - 7	MIPR	Redstone Garrison : Huntsville, AL	0.000	0.040	Nov 2015	0.000		0.000		-		0.000	0	0.040	0
Consumables - Intercontinental Ballistic Missiles (ICBM) - 8	MIPR	Reagan Test Site : Kwajalein Atoll	0.000	2.836	Nov 2015	0.000		0.000		-		0.000	0	2.836	0
Consumables - Multi-Class - 1	C/CPAF	Lockheed Martin Space Systems Company : Courtland, AL	164.796	38.407	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Multi-Class - 2	C/CPAF	Lockheed Martin Space Systems Company : United Kingdom	18.189	3.281	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Multi-Class - 6	C/CPAF	Associated Objects RFP : TBD	0.000	17.536	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
0400 / 4				PE 0603915C / Ballistic Missile Defense Targets				MT05 / BMDS Targets Program							
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Planning & Operations - Program Planning and Operations - 1	C/CPAF	Targets TEAMS Support : Huntsville, AL	121.835	30.292	Nov 2015	34.579	Nov 2016	35.948	Nov 2017	-		35.948	Continuing	Continuing	Continuing
Program Planning & Operations - Program Planning and Operations - 10	MIPR	Missile Defense Agency : Huntsville, AL	86.485	28.293	Oct 2015	28.688	Oct 2016	29.992	Oct 2017	-		29.992	Continuing	Continuing	Continuing
Program Planning & Operations - Program Planning and Operations - 12	C/FFP	Network Management Resources : Chantilly, VA	1.276	0.707	Nov 2015	0.866	Nov 2016	0.133	Nov 2017	-		0.133	Continuing	Continuing	Continuing
Program Planning & Operations - Program Planning and Operations - 13	MIPR	Naval Surface Warfare Center : Crane, IN	0.000	0.000		0.000		0.273	Nov 2017	-		0.273	Continuing	Continuing	Continuing
Program Planning & Operations - Program Planning and Operations - 6	FFRDC	Johns Hopkins University, Applied Physics Lab : Baltimore, MD	1.778	0.581	Nov 2015	0.586	Nov 2016	1.118	Dec 2017	-		1.118	Continuing	Continuing	Continuing
Program Planning & Operations - Program Planning and Operations - 7	MIPR	US Army Aviation & Missile Command : Huntsville, AL	4.345	0.930	Nov 2015	0.000		0.406	Nov 2017	-		0.406	0	5.681	0
Program Planning & Operations - Program Planning and Operations - 8	MIPR	Aviation & Missile Research, Dev & Eng Center : Huntsville, AL	4.486	1.803	Nov 2015	0.000		0.000		-		0.000	0	6.289	0
Program Planning & Operations - Program Planning and Operations - 9	MIPR	US Air Force Space & Missile Systems Center (SMC) : Albuquerque, NM	3.011	0.582	Nov 2015	2.654	Nov 2016	0.241	Nov 2017	-		0.241	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 37	FFRDC	Aerospace Corporation : El Segundo, CA	0.000	0.000		0.000		1.967	Nov 2017	-		1.967	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Resources - Resources/ Logistics - 38	MIPR	Redstone Test Center : Huntsville, AL	0.000	0.000		0.000		0.510	Nov 2017	-		0.510	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 39	MIPR	Defense Information Systems Agency : Fort Meade, MD	0.000	0.000		0.000		0.082	Dec 2017	-		0.082	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 40	MIPR	Army Information Management Command : San Antonio, TX	0.000	0.000		0.000		0.620	Dec 2017	-		0.620	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 41	MIPR	Marshall Space Flight Center : Huntsville, AL	0.000	0.000		0.000		0.010	Dec 2017	-		0.010	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 42	MIPR	Dugway Proving Ground : Dugway, UT	0.000	0.000		0.000		0.004	Dec 2017	-		0.004	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 1	C/CPAF	Lockheed Martin Space Systems Company : Courtland, AL	27.431	8.850	Nov 2015	7.861	Nov 2016	6.774	Nov 2017	-		6.774	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 11	MIPR	Naval Surface Warfare Center : Crane, IN	3.806	0.000		0.000		0.040	Dec 2017	-		0.040	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 12	MIPR	Redstone Arsenal Garrison : Huntsville, AL	3.181	0.040	Nov 2015	0.040	Nov 2016	0.011	Nov 2017	-		0.011	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 16	MIPR	US Property & Fiscal Office for Arizona : Phoenix, AZ	6.565	0.429	Nov 2015	0.000		1.963	Nov 2017	-		1.963	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 17	MIPR	US Army White Sands Missile Range : White Sands, NM	0.538	0.000		0.518	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Resources - Resources/ Logistics - 18	MIPR	Defense Finance & Accounting Service : Indianapolis, IN	2.410	0.317	Nov 2015	0.323	Nov 2016	0.641	Nov 2017	-		0.641	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 2	C/CPFF	Orbital/Alliant Techsystems : Magna, UT	0.790	0.000		0.255	Nov 2016	0.982	Nov 2017	-		0.982	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 21	MIPR	US Air Force Space & Missile Systems Center (SMC) : Albuquerque, NM	7.923	9.867	Nov 2015	3.813	Nov 2016	2.474	Nov 2017	-		2.474	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 23	C/FFP	Venturi Aerospace : Huntsville, AL	2.115	0.000		0.026	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 24	C/FFP	TASC, Inc. : Albuquerque, NM	6.375	0.792	Nov 2015	0.767	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 25	MIPR	Tooele Army Depot : Tooele, UT	1.122	0.000		0.049	Nov 2016	0.446	Dec 2017	-		0.446	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 3	C/FFP	Aerojet Corporation : Albuquerque, NM	0.590	0.253	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 34	C/CPFF	Inuteq, Corp. : Beltsville, MD	0.791	0.730	Nov 2015	0.755	Nov 2016	0.791	Nov 2017	-		0.791	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 35	MIPR	Space and Naval Warfare Systems Command : San Diego, CA	0.000	0.000		0.022	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 36	MIPR	Tobyhanna Army Depot : Tobyhanna, PA	0.000	0.000		1.089	Nov 2016	1.101	Nov 2017	-		1.101	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 5	MIPR	Aviation & Missile Research, Dev & Eng Center : Huntsville, AL	7.451	1.448	Nov 2015	0.284	Nov 2016	0.268	Nov 2017	-		0.268	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 6	MIPR	Hill Air Force Base : Ogden, UT	3.948	0.000		2.030	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Resources - Resources/ Logistics - 7	MIPR	Missile Defense Agency : Huntsville, AL	6.903	0.938	Oct 2015	0.197	Oct 2016	0.119	Nov 2017	-		0.119	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 1	C/CPAF	Lockheed Martin Space Systems Company : Courtland, AL	70.854	17.042	Nov 2015	17.392	Nov 2016	13.828	Nov 2017	-		13.828	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 10	FFRDC	Sandia National Laboratories : Albuquerque, NM	3.849	0.520	Dec 2015	0.549	Dec 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 14	MIPR	Naval Air Warfare Center : Point Mugu, CA	2.386	1.650	Nov 2015	1.913	Nov 2016	0.986	Nov 2017	-		0.986	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 15	MIPR	Missile Defense Agency : Huntsville, AL	0.000	0.000		1.715	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 16	TBD	L167 Support : TBD	0.000	0.000		0.000		10.263	Mar 2018	-		10.263	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 2	FFRDC	Aerospace Corporation : El Segundo, CA	11.556	2.540	Nov 2015	2.632	Nov 2016	3.382	Dec 2017	-		3.382	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 6	FFRDC	Johns Hopkins University, Applied Physics Lab : Baltimore, MD	1.933	0.782	Nov 2015	0.798	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 7	MIPR	US Air Force Space & Missile Systems Center (SMC) : Albuquerque, NM	4.995	4.183	Nov 2015	4.871	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 8	MIPR	Aviation & Missile Research, Dev & Eng Center : Huntsville, AL	35.172	9.093	Nov 2015	9.937	Nov 2016	8.983	Nov 2017	-		8.983	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Flight Test Execution - 1	MIPR	Missile Defense Agency : Huntsville, AL	0.000	0.382	Oct 2015	0.374	Oct 2016	0.319	Oct 2017	-		0.319	Continuing	Continuing	Continuing
Flight Test Execution - 10	MIPR	Hickam Field : Pearl Harbor, HI	0.000	0.205	Nov 2015	0.184	Nov 2016	0.097	Dec 2017	-		0.097	Continuing	Continuing	Continuing
Flight Test Execution - 11	MIPR	Redstone Army Airfield : Redstone Arsenal, AL	0.000	0.019	Nov 2015	0.019	Nov 2016	0.224	Dec 2017	-		0.224	Continuing	Continuing	Continuing
Flight Test Execution - 12	MIPR	Redstone Test Center : Huntsville, AL	0.000	0.115	Nov 2015	0.111	Nov 2016	0.048	Nov 2017	-		0.048	Continuing	Continuing	Continuing
Flight Test Execution - 13	C/CPAF	Orbital Sciences Corporation : Chandler, AZ	0.000	1.488	Nov 2015	2.072	Nov 2016	1.921	Nov 2017	-		1.921	Continuing	Continuing	Continuing
Flight Test Execution - 14	MIPR	Naval Air Warfare Center : Pt. Mugu, CA	0.000	0.429	Nov 2015	0.436	Nov 2016	3.435	Dec 2017	-		3.435	Continuing	Continuing	Continuing
Flight Test Execution - 15	C/CPAF	Lockheed Martin Space Systems Company : Courtland, AL	0.000	0.000		0.000		0.019	Dec 2017	-		0.019	Continuing	Continuing	Continuing
Flight Test Execution - 16	MIPR	Charleston Air Force Base : Charleston, SC	0.000	0.000		0.000		0.022	Dec 2017	-		0.022	Continuing	Continuing	Continuing
Flight Test Execution - 17	MIPR	Columbus Air Force Base : Columbus, MS	0.000	0.000		0.000		0.022	Dec 2017	-		0.022	Continuing	Continuing	Continuing
Flight Test Execution - 18	MIPR	Naval Surface Warfare Center : Dahlgren, VA	0.000	0.000		0.000		0.241	Nov 2017	-		0.241	Continuing	Continuing	Continuing
Flight Test Execution - 19	MIPR	National Security Agency : Fort Meade, MD	0.000	0.000		0.000		0.066	Dec 2017	-		0.066	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Flight Test Execution - 2	MIPR	Defense Finance and Accounting Services : Indianapolis, IN	0.000	6.388	Nov 2015	11.052	Nov 2016	11.323	Oct 2017	-		11.323	Continuing	Continuing	Continuing
Flight Test Execution - 3	MIPR	Pacific Missile Range Facility : Barking Sands, HI	0.000	6.281	Nov 2015	11.607	Nov 2016	1.820	Nov 2017	-		1.820	Continuing	Continuing	Continuing
Flight Test Execution - 4	MIPR	Reagan Test Site : Kwajalein Atoll	0.000	3.124	Nov 2015	6.031	Nov 2016	4.294	Nov 2017	-		4.294	Continuing	Continuing	Continuing
Flight Test Execution - 5	MIPR	Edwards Air Force Base : Lancaster, CA	0.000	2.332	Nov 2015	6.102	Nov 2016	9.198	Dec 2017	-		9.198	Continuing	Continuing	Continuing
Flight Test Execution - 6	MIPR	US Army Yuma Proving Ground : Yuma, AZ	0.000	0.285	Nov 2015	0.298	Nov 2016	1.730	Nov 2017	-		1.730	Continuing	Continuing	Continuing
Flight Test Execution - 7	MIPR	Eglin Air Force Base : Eglin AFB, FL	0.000	0.137	Nov 2015	0.167	Nov 2016	0.275	Nov 2017	-		0.275	Continuing	Continuing	Continuing
Flight Test Execution - 8	C/CPAF	L3 Communications/ Coleman Aerospace : Orlando, FL	0.000	0.727	Nov 2015	1.666	Nov 2016	0.676	Nov 2017	-		0.676	Continuing	Continuing	Continuing
Flight Test Execution - 9	MIPR	Air Force Research Laboratory : Wright Patterson AFB, OH	0.000	0.475	Nov 2015	0.499	Nov 2016	1.349	Dec 2017	-		1.349	Continuing	Continuing	Continuing
Subtotal			1,683.767	503.325		539.837		391.957		-		391.957	-	-	-

Remarks

N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,683.767	503.325	539.837	391.957	-	391.957	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 4)	▲													
MRBM Type 3 Pre-Ship Readiness Review (Ship Set 3)		▲												
LV-2 Pre-Ship Readiness Review (Ship Set 6)			▲											
ICBM Pre-Ship Readiness Review (Ship Set 1)				▲										
MRBM Type 3 Pre-Ship Readiness Review (Ship Set 4)				▲										
ARAV-TTO-E (SRBM) Pre-Ship Readiness Review (Ship Set 1)				▲										
ARAV-TTO-E (SRBM) Pre-Ship Readiness Review (Ship Set 4)					▲									
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 2)						▲								
ELRALT Pre-Ship Readiness Review (Ship Set 2)						▲								
ARAV-TTO-E (SRBM) Pre-Ship Readiness Review (Ship Set 3)							△							
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 5)								△						
MRBM Type 3 Pre-Ship Readiness Review (Ship Set 2)									△					
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 6)										△				
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 7)											△			
ICBM Pre-Ship Readiness Review (Ship Set 2)												△		
MRBM Type 3/Configuration 2 Pre-Ship Readiness Review (Ship Set 5)													△	
MRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 1)														△
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 8)														△
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 9)														△
ARAV-G (SRBM) Pre-Ship Readiness Review (Ship Set 1)														△
ARAV-G (SRBM) Pre-Ship Readiness Review (Ship Set 2)														△
MRBM Type 3/Configuration 2 Pre-Ship Readiness Review (Ship Set 6)														△
MRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 2)														△
MRBM Type 4-E Pre-Ship Readiness Review (Ship Set 6)														△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 4)	1	2016	1	2016
MRBM Type 3 Pre-Ship Readiness Review (Ship Set 3)	2	2016	2	2016
LV-2 Pre-Ship Readiness Review (Ship Set 6)	3	2016	3	2016
ICBM Pre-Ship Readiness Review (Ship Set 1)	4	2016	4	2016
MRBM Type 3 Pre-Ship Readiness Review (Ship Set 4)	4	2016	4	2016
ARAV-TTO-E (SRBM) Pre-Ship Readiness Review (Ship Set 1)	4	2016	4	2016
ARAV-TTO-E (SRBM) Pre-Ship Readiness Review (Ship Set 4)	1	2017	1	2017
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 2)	2	2017	2	2017
ELRALT Pre-Ship Readiness Review (Ship Set 2)	2	2017	2	2017
ARAV-TTO-E (SRBM) Pre-Ship Readiness Review (Ship Set 3)	3	2017	3	2017
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 5)	4	2017	4	2017
MRBM Type 3 Pre-Ship Readiness Review (Ship Set 2)	4	2017	4	2017
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 6)	2	2018	2	2018
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 7)	2	2018	2	2018
ICBM Pre-Ship Readiness Review (Ship Set 2)	3	2018	3	2018
MRBM Type 3/Configuration 2 Pre-Ship Readiness Review (Ship Set 5)	4	2018	4	2018
MRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 1)	1	2019	1	2019
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 8)	1	2019	1	2019
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 9)	1	2019	1	2019
ARAV-G (SRBM) Pre-Ship Readiness Review (Ship Set 1)	2	2019	2	2019
ARAV-G (SRBM) Pre-Ship Readiness Review (Ship Set 2)	2	2019	2	2019
MRBM Type 3/Configuration 2 Pre-Ship Readiness Review (Ship Set 6)	2	2019	2	2019

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MT05 / <i>BMDS Targets Program</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
MRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 2)	3	2019	3	2019
MRBM Type 4-E Pre-Ship Readiness Review (Ship Set 6)	3	2019	3	2019
MRBM Type 4-E Pre-Ship Readiness Review (Ship Set 7)	3	2019	3	2019
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 10)	2	2020	2	2020
MRBM Type 3/Configuration 2 Pre-Ship Readiness Review (Ship Set 7)	2	2020	2	2020
MRBM Type 4-E Pre-Ship Readiness Review (Ship Set 11)	3	2020	3	2020
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 11)	4	2020	4	2020
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 12)	2	2021	2	2021
MRBM Type 3/Configuration 2 Pre-Ship Readiness Review (Ship Set 8)	2	2021	2	2021
MRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 3)	3	2021	3	2021
ICBM Pre-Ship Readiness Review (Ship Set 3)	4	2021	4	2021
MRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 4)	2	2022	2	2022
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 13)	2	2022	2	2022
SRBM Type 4-B Pre-Ship Readiness Review (Ship Set 25)	2	2022	2	2022
SRBM Type 4-B Pre-Ship Readiness Review (Ship Set 26)	2	2022	2	2022
SRBM Type 4-B Pre-Ship Readiness Review (Ship Set 27)	2	2022	2	2022
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 14)	4	2022	4	2022
ICBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 4)	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>				Project (Number/Name) MD40 / <i>Program Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program Wide Support</i>	61.184	14.199	23.739	18.217	-	18.217	17.991	18.658	19.273	20.166	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2016, FY 2017, and FY 2018 Program Wide Support reflects proportional changes as a result of budget changes to the Ballistic Missile Defense Targets. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	14.199	23.739	18.217
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	14.199	23.739	18.217

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance (MIPR)	MIPR	Various Multi : AL, CO, CA, VA etc.	19.978	0.399		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Facilities and Maintenance (Reqn)	Reqn	Various Multi : AL, CO, CA, VA etc.	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Infrastructure Support (MIPR)	MIPR	Various; Multi : AL, VA	27.237	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Infrastructure Support (FFP)	C/FFP	Northrop Grumman; Multi : AL, VA	9.460	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various; Multi : AL, CA, CO, VA	2.212	2.939	Nov 2015	0.509	Jul 2017	0.364	Jul 2018	-		0.364	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi:AL, CA, CO, VA	0.000	5.560	Nov 2015	8.029	Aug 2017	10.591	Aug 2018	-		10.591	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support, International, and Materiel and Readiness	MIPR	Various Multi: : AK, AL, CA, CO, HI, VA	0.623	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	Allot	Various, Multi : AL, CO, CA, VA etc	1.674	1.525	Dec 2015	1.500	Sep 2017	1.500	Sep 2018	-		1.500	Continuing	Continuing	Continuing
Program Wide Support - Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, VA	0.000	3.776	Jan 2016	13.701	Jan 2017	5.762	Jan 2018	-		5.762	Continuing	Continuing	Continuing
Subtotal			61.184	14.199		23.739		18.217		-		18.217	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency								Date: May 2017					
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>				Project (Number/Name) MD40 / <i>Program Wide Support</i>					
	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	61.184	14.199		23.739		18.217		-		18.217	-	-	-

Remarks

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆				
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇				
		FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
MD40 Program-Wide Support		◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / <i>Ballistic Missile Defense Targets</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	24.743	99.366	128.406	-	128.406	168.388	174.432	176.660	177.264	Continuing	Continuing
MD98: <i>Directed Energy Demonstrator Development</i>	-	0.000	23.744	48.099	-	48.099	76.979	66.958	61.334	71.437	Continuing	Continuing
MD99: <i>Discrimination Sensor Demonstrator Development</i>	-	18.362	57.382	73.295	-	73.295	76.985	93.876	103.683	95.845	Continuing	Continuing
MT99: <i>Technology Maturation Initiatives Test</i>	-	2.070	13.508	0.220	-	0.220	4.476	4.327	1.857	0.000	0	26.458
MC98: <i>Cyber Operations</i>	-	0.140	0.168	0.172	-	0.172	0.257	0.179	0.182	0.272	Continuing	Continuing
MD40: <i>Program Wide Support</i>	-	4.171	4.564	6.620	-	6.620	9.691	9.092	9.604	9.710	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note
N/A

A. Mission Description and Budget Item Justification

Technology Maturation Initiatives develops technology that is matured beyond the laboratory. Technology Maturation Initiatives builds on the MDA Configured Block 1 MQ-9 Reaper Remotely Piloted Aircraft (RPA) missile tracking technology successfully developed under the Discrimination Sensor Technology Program Element 0603177C, improving accuracy, adding range, and conducting operationally representative airborne sensor tests. This Program Element will transition to the use of Block 5 Big Wing (BW) MQ-9 RPA, equipped with an advanced sensor (tracking lasers, advanced detectors, infrared sensors, and precision tracking and discrimination algorithms). It also incorporates industry technology breakthroughs to develop and demonstrate low to mid power lasers on a high altitude airborne platform. Together, these advanced components and tests address complex tracking, discrimination, and boost phase kill challenges for the Ballistic Missile Defense System (BMDS) in support of the Strategic Commands Prioritized Capabilities List and address evolving threats to the homeland from the Pacific theater.

- MDA will develop cost effective technology demonstrators to address specific risks:
- A high altitude low power laser equipped airborne system to demonstrate finding, tracking and engaging boosting missiles at the standoff ranges required for missile defense
 - An advanced sensor integrated into a MDA Configured MQ-9 to provide discrimination of lethal objects
 - An advanced sensor space payload that builds on the airborne discrimination program to demonstrate persistent overhead discrimination coverage
 - Continuation of testing of the passive MDA Configured MQ-9 system to validate performance against emerging advanced threats

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>
---	--

The Low Power Laser Demonstrator program integrates a tracking laser with a more powerful mission laser and larger beam control systems on a high altitude airborne platform. This airborne demonstrator addresses a broad spectrum of directed energy mission applications while refining a missile defense concept of operations doctrine for incorporating lasers into the BMDS. MDA's directed energy plan incrementally demonstrates and improves the constituent components required to execute a directed energy kill chain; acquisition, tracking and lethality. The Agency will select from industry concepts to integrate and test a low to mid power laser on a high altitude airborne platform. The Low Power Laser Demonstrator shapes future BMDS acquisition decisions by advancing and documenting the technology readiness levels of emerging and developing technology, while simultaneously assessing the performance and contributions to the BMDS architecture.

The MDA Configured MQ-9 provides a low cost, mid-altitude unmanned test platform capable of carrying small laser and advanced sensor payloads. This platform allows MDA to introduce unmanned systems and tracking lasers into the BMDS, develop the associated concept of operations and provide the basis for a quick reaction precision tracking capability to augment radar. The advanced sensor incorporates incrementally developed, integrated, and tested next-generation sensors and detectors to demonstrate Launch-on-Remote, Engage-on-Remote, discrimination and handover improvements for missile defense first from the air and then from space. These advanced sensors improve the probability of engagement success for stressing threats, expand the BMD battle space and increase the ability to negate larger raid sizes.

To address emerging advanced threats, MDA may use MDA-configured MQ-9s to support hypersonic threat testing scenarios.

FY 2017 Amended Budget Request Justification: \$+9.100M addresses emergency warfighting readiness requirements to ensure readiness of the BMDS. \$+9.100M Project MT99-Technology Maturation Initiatives Test/Technology Maturation Initiatives Test to leverage an upcoming hypersonic test event for data collection, and to support threat model validation, detection, tracking and simulated engagement concepts evaluation to address an Emerging Threat and to investigate and demonstrate sensors and systems for integrating left and right of launch.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	27.225	90.266	149.901	-	149.901
Current President's Budget	24.743	99.366	128.406	-	128.406
Total Adjustments	-2.482	9.100	-21.495	-	-21.495
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-2.012	0.000			
• SBIR/STTR Transfer	-0.470	0.000			
• Other Adjustment	0.000	9.100	-21.495	-	-21.495

Change Summary Explanation

The decrease in FY2018 from PB17 to PB18 reflects a realignment of department priorities and reduction of funding in Directed Energy.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity	R-1 Program Element (Number/Name)
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0604115C / <i>Technology Maturation Initiatives</i>

FY 2017 Amended Budget Request Justification: \$+9.100M is required to address emergency warfighting readiness requirements to ensure readiness of the BMDS.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>				Project (Number/Name) MD98 / <i>Directed Energy Demonstrator Development</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD98: <i>Directed Energy Demonstrator Development</i>	-	0.000	23.744	48.099	-	48.099	76.979	66.958	61.334	71.437	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2017 to FY 2018 funds the ramp up in Industry personnel required to transition from the initial design phase to full demonstrator development and purchase of long lead hardware required to build and test a LPLD based on the cost and schedule provided during industry's concept definition studies.

A. Mission Description and Budget Item Justification

The Directed Energy Demonstrator Development project develops, integrates, and tests the technologies required to demonstrate the complete acquisition, tracking and lethality engagement sequence of a high energy laser system for boost-phase missile defense. The Low Power Laser Demonstrator (LPLD) builds on tracking technology developed under the Discrimination Sensor Technology Program Element (0603117C) with laser technology developed under the Weapons Technology Program Element (0603178C) and industry concepts for a cost-effective demonstrator. The demonstrator will integrate the lasers, detectors, beam control system, processors, power supplies and thermal management systems into a high altitude airborne platform for missile defense laser applications. MDA will test the laser platform under realistic conditions in conjunction with on-going BMDS tests.

This approach informs a missile defense laser concept of operations under realistic BMDS scenarios. The Directed Energy Demonstrator Development project provides the necessary technology, test data, and operations familiarity to successfully transition to a higher power directed energy weapon capable of destroying a boosting missile before payloads deploy, complicating kill.

The technology, individually and jointly developed and tested by MDA, the Air Force and the Defense Advanced Research Projects Agency (DARPA) under the Weapons Technology program element, underpins multiple LPLD Industry concepts. This LPLD provides additional collaborative development and test opportunities to investigate laser beam pointing, stability and jitter effects under various altitude and flight conditions.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Directed Energy Demonstrator Development	0.000	23.744	48.099
Articles:	-	-	-
Description: The Directed Energy Demonstrator Development project designs, integrates, and tests a Low Power Laser Demonstrator (LPLD) for missile defense. Depending on the specific industry initial design selected to continue through critical design, the demonstrator will consist of a kilowatt (kW)-class tracking laser, a multi-kilowatt class mission laser and a 0.5 meter telescope. A key risk area to cost effective boost phase kill is acquisition, tracking and beam stability at long stand-off ranges.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD98 / <i>Directed Energy Demonstrator Development</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>The demonstrator will incrementally verify acquisition and tracking, laser pointing and stability accuracy at extended ranges, then mission laser effectiveness at shorter ranges.</p> <p>The LPLD provides an autonomously controlled laser-equipped airborne platform to develop a missile defense directed energy Concept of Operations (CONOPS). The laser flight system, beam control methodology and laser CONOPS inform development of higher power, higher altitude directed energy systems necessary for missile defense.</p> <p>FY 2016 Accomplishments: Under the Weapons Technology PE completed 5, \$1M industry concept definition studies and conducted concept trade analysis, updated Advanced Technology Innovation - Broad Agency Announcement (ATI-BAA) and solicited white papers for follow on design and build phases of the program. Selected beam control as highest priority to maximize laser intensity at the target.</p> <p>FY 2017 Plans: Award multiple contracts through a tailored Preliminary Design Review (PDR) to conduct the systems engineering and preliminary design necessary to define a LPLD that integrates the lasers, detectors, beam control system, processors, power supplies and thermal management systems into an airborne platform for missile defense.</p> <ul style="list-style-type: none"> - Analyze and evaluate industry concepts for integrating and testing a multi-kW class laser into an airborne platform for missile defense applications -- Determine the best laser/aircraft combination to cost effectively address the directed energy missile defense mission space -- Award three contracts through a tailored PDR - Perform the directed energy requirements flow down and engineering analysis for a LPLD - Define a preliminary directed energy concept of operations for laser equipped high altitude airborne platform participation in BMDS tests <p>FY 2018 Plans: The increase from FY 2017 to FY 2018 funds the ramp up in Industry personnel required to transition from the initial design phase to full demonstrator development and purchase of long lead hardware required to build and test a LPLD based on the cost and schedule provided during industry's concept definition studies.</p> <p>Complete the systems engineering and preliminary design for the LPLD that integrates the lasers, detectors, beam control system, processors, power supplies and thermal management systems into an airborne platform for missile defense.</p> <ul style="list-style-type: none"> - Complete the initial design through PDR -- Complete LPLD requirements flow down and engineering analysis -- Define long lead procurement requirements -- Conduct PDR - Select the best laser/aircraft design to demonstrate pointing and tracking, beam control and lethality. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD98 / <i>Directed Energy Demonstrator Development</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Award a follow-on contract for continued development through a tailored Critical Design Review (CDR) and begin long lead material procurement -- Complete long lead build to drawings and release for fabrication -- Refine the directed energy concept of operations for laser equipped high altitude airborne platforms			
Accomplishments/Planned Programs Subtotals	0.000	23.744	48.099

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing

Remarks

D. Acquisition Strategy
The acquisition strategy for MD98, Directed Energy Development, consists of contracts to industry via the Advanced Technology Innovation Broad Agency Announcement and competitive procurement(s) to develop and demonstrate a LPLD system in realistic test environments. The MDA will leverage Agency, partner subject matter experts and use government model based assessments to inform Better Buying Power philosophy acquisition decisions.

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD98 / <i>Directed Energy Demonstrator Development</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Directed Energy Demonstrator Development - LPLD Continued Best Design	C/CPFF	TBD : TBD	0.000	0.000		0.000		16.175	May 2018	-		16.175	Continuing	Continuing	Continuing
Directed Energy Demonstrator Development - LPLD Preliminary Design A	C/CPFF	Lockheed Martin : CA	0.000	0.000		6.940	Jul 2017	9.000	Nov 2017	-		9.000	Continuing	Continuing	Continuing
Directed Energy Demonstrator Development - LPLD- Preliminary Design B	C/CPFF	General Atomics : CA	0.000	0.000		6.940	Jul 2017	9.000	Nov 2017	-		9.000	Continuing	Continuing	Continuing
Directed Energy Demonstrator Development - LPLD- Preliminary Design C	C/CPFF	Boeing : CA	0.000	0.000		6.940	Jul 2017	9.000	Nov 2017	-		9.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		20.820		43.175		-		43.175	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Directed Energy Demonstrator Development - Agency Operations – Civilian Salaries and Travel	Allot	MDA Multi : AL, NM	0.000	0.000		0.000		0.219	Oct 2017	-		0.219	Continuing	Continuing	Continuing
Directed Energy Demonstrator Development - LPLD- Performance Analysis	MIPR	MIT LL, Aviation and Missile Research Development and	0.000	0.000		1.600	Jan 2017	2.556	Jan 2018	-		2.556	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD98 / <i>Directed Energy Demonstrator Development</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Engineering Center (AMRDEC) : MA, AL													
Directed Energy Demonstrator Development - LPLD-Engineering and Technical Services	MIPR	Aviation and Missile Research Development and Engineering Center (AMRDEC) : AL	0.000	0.000		1.324	Oct 2016	2.149	Oct 2017	-		2.149	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		2.924		4.924		-		4.924	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	23.744	48.099	-	48.099	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD98 / <i>Directed Energy Demonstrator Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
LPLD Contract Awards	4	2017	4	2017
LPLD tailored PDR	3	2018	3	2018
LPLD tailored CDR	4	2019	4	2019
LPLD Checkout Ground Test	3	2021	3	2021
LPLD Checkout Flight Test	1	2022	1	2022
Target Acquisition and Tracking Demonstration	2	2022	2	2022
Beam Control and Stability Demonstration	3	2022	3	2022
Laser Concept of Operations	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>				Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD99: <i>Discrimination Sensor Demonstrator Development</i>	-	18.362	57.382	73.295	-	73.295	76.985	93.876	103.683	95.845	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2017 to FY 2018 reflects Discrimination Sensor Demonstrator flight qualification hardware build, aircraft integration, and flight qualification of the updated MDA-configured MQ-9 aircraft.

A. Mission Description and Budget Item Justification

Discrimination Sensor Demonstrator Development, builds on the technology developed and demonstrated in the Discrimination Sensor Technology Program Element 0603177C. Areas of concentration include tracking lasers, advanced detectors, infrared sensors, and precision tracking and discrimination algorithms (constitutes the advanced sensor system). Discrimination Sensor Demonstrator Development pursues a cost-effective incremental upgrade philosophy that demonstrates precision track of advanced threats at extended ranges, simple scene discrimination and then complex scene discrimination through ground, flight, and space demonstrations.

This project develops and tests high-precision advanced sensors to improve identifying, acquiring, tracking and discriminating incoming ballistic missile threats, specifically addressing U.S. Strategic Commands Prioritized Capabilities List requirements. Discrimination Sensor Demonstrator Development enhances the BMDS capability to discriminate lethal objects in a threat cluster, and track and hand over the threat object with Aegis Launch on Remote and Engage on Remote precision. Aegis Launch on Remote is the capability that allows Aegis BMD to launch an interceptor before its own radar acquires the threat. Aegis BMD Launch on Remote involves Command, Control, Battle Management and Communications providing information about the paths (called tracks) of ballistic missile threats to Aegis BMD from forward based radars. It expands the space where the system can intercept the threat and the defended area. Engage on Remote engagement allows Aegis to use off board sensor information to launch and guide the Standard Missile - 3 (SM-3) missile to final intercept. The increased kinematics envelope of the SM-3 Block IIA, when combined with Engage on Remote capability, will expand battlespace and increase the number of threats engaged.

Discrimination Sensor Demonstrator Development uses an incremental development and test approach to address risk through a series of ground, air, then space demonstrations. This project funds development of next-generation advanced sensor systems to include tracking lasers, specialized detectors, and unique processors and the corollary ground, airborne and space subsystems required for BMDS test. These advanced sensors operate at the strategic ranges required to augment BMDS radar, improve the BMDS discrimination capability and provide precision track of large raids. These advanced sensor systems can track multiple targets simultaneously, substantially reducing the number of sensor assets required for large raids.

MDA tests promising advanced sensor technology at the Mt Wilson Aerospace Facility for Integrated Optical Test (MAFIOT) in California. This ground testbed provides line of sight viewing of missile launches from Vandenberg AFB and San Nicolas Island.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>
--	--	--

This project includes advanced sensor integration into a high altitude airborne platform, a MDA Configured MQ-9 aircraft, and testing in operationally relevant environments. The MDA Configured MQ-9 aircraft equipped with an advanced sensor provides the MDA a viable quick reaction capability to augment BMDS radar.

The program will leverage the technology demonstrated from the ground and in the air to build space qualified advanced sensor payloads. These cost-effective focal plane array and advanced sensor space demonstrations inform future BMDS space layer decisions for persistent tracking and discrimination.

MDA will also partner with the Services to develop concepts for the cost effective integration of the sensor technology successfully demonstrated under the Discrimination Sensor Technology Program Element into limited fielding upgrade kits. The concept information will inform a MDA Product Development Decision for further development and/or limited fielding decisions. These kits could be installed on MQ-9 aircraft deployed in theater to add missile defense capabilities on short notice.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Title: Discrimination Sensor Demonstrator Development</p> <p align="right">Articles:</p> <p>Description: This project develops an advanced sensor for participation in BMDS tests under operationally relevant conditions and at operationally relevant ranges. The sensors upgrade the proven Multi-Spectral Targeting System (MTS) / MQ-9 Aircraft combination demonstrated under the Discrimination Sensor Technology Program Element to perform tracking and discrimination of lethal objects.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Initiated design and development of an advanced sensor for MTS-C / MQ-9 Reaper integration that supports improved BMDS discrimination capability -- Began the preliminary design of an advanced sensor -- Conducted integration and component test of advanced sensor subsystems -- Performed laboratory testing to verify subsystem performance -- Analyzed laboratory test data to verify advanced sensor precision track and discrimination capability - Conducted compact advanced sensor ground tests against targets of opportunity to verify tracking and algorithm performance for BMDS discrimination <p>FY 2017 Plans:</p> <p>In FY 2017, an increase of \$39.020 million funds MD99, Discrimination Sensor build, ground test, aircraft integration, and flight qualification.</p> <ul style="list-style-type: none"> - Continue development and test of an advanced sensor equipped MTS-C and MDA Configured MQ-9 Aircraft system -- Conduct a Preliminary Design Review (PDR) for the advanced sensor system -- Conduct a Critical Design Review (CDR) for the advanced sensor system 	<p>18.362</p> <p align="center">-</p>	<p>57.382</p> <p align="center">-</p>	<p>73.295</p> <p align="center">-</p>

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-- Initiate development of the flight qualified payload system -- Upgrade the MTS-C to improve pointing and test in the laboratory -- Develop a new chin mount for the MQ-9 Aircraft that increases MTS-C mount rigidity while minimizing weight and drag - Complete development and ground test of a compact, fully packaged, flight qualifiable advanced sensor for future integration into a high altitude platform - Participate in multiple Target of Opportunity (TOO) tests to include Glory Trip (GT)-219, GT-220, GT-221 and World View (WV)-4 FY 2018 Plans: The increase from FY 2017 to FY 2018 reflects Discrimination Sensor continued build, aircraft integration, and flight qualification. - Continue development of the advanced sensor system to include the laser, detector, and unique advanced processor - Conduct missile boost-phase tracking tests with advanced sensor ground testbed -- Develop and improve algorithms and models based on data from advanced sensor ground testbeds -- Conduct airborne advanced sensor ground-truth tests with ground testbed -- Conduct advanced sensor risk reduction tests at ground testbeds - Conduct a flight laboratory test for a compact combined advanced sensor - Complete build and begin integration of a flight qualified laser system onto a MQ-9 Aircraft - Solicit a Broad Agency Announcement for advanced sensor for space concept definition			
Accomplishments/Planned Programs Subtotals	18.362	57.382	73.295

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing

Remarks

D. Acquisition Strategy

The acquisition strategy for MD99, Discrimination Sensor Demonstrator Development consists of a contract(s) to industry via the Advanced Technology Innovation Broad Agency Announcement and competitive procurements and agreements with Federally Funded Research and Development Centers to develop and demonstrate an advanced sensor system in realistic test environments. The MDA will leverage Agency, partner subject matter experts and use government model based assessments to inform Better Buying Power philosophy acquisition decisions.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Discrimination Sensor Demonstrator Development - Advanced Sensor Development Support	MIPR	Aerospace, MIT/LL : CA, MA	0.000	0.436		0.936		0.000		-		0.000	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Advanced Sensor Flight Demonstrator	Various	General Atomics, MIT/LL, TBD : C, MA, TBD	0.000	0.000		24.500		53.423	Aug 2018	-		53.423	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Advanced Sensor Ground Test	MIPR	MIT LL, Aerospace : MA, CA	0.000	8.698	Dec 2015	2.300		1.673	Oct 2017	-		1.673	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Advanced Sensor Laboratory Test	C/CPFF	General Atomics : CA	0.000	1.655		6.454		0.000		-		0.000	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Advanced Sensor Performance Analysis Aegis Engage on Remote Concept Assessment	MIPR	MIT LL : MA	0.000	0.500	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Advanced Sensor Performance Analysis Aegis Engage on Remote Hardware in the Loop (HWIL)	MIPR	MIT LL, Aviation and Missile Research, Development, and Engineering Center (AMRDEC) : MA, AL	0.000	0.000		5.800		6.100	Nov 2017	-		6.100	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Airborne EO/IR Demonstrator	C/CPFF	General Atomics : CA	0.000	1.708		6.041		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			0.000	12.997		46.031		61.196		-		61.196	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Discrimination Sensor Demonstrator Development - Agency Operations - Advisory and Assistance Services	C/CPFF	Various : NM, AL	0.000	0.241		3.103		3.164	Oct 2017	-		3.164	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Agency Operations - Engineering and Technical Services	MIPR	Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Aerospace : AL, CA	0.000	1.198	Dec 2015	1.371		0.811	Oct 2017	-		0.811	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Agency Operations - Civilian Salaries and Travel	Allot	MDA Multi : AL, NM	0.000	1.366		4.608		4.804	Oct 2017	-		4.804	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Agency Operations - Facility Support	MIPR	377th ABW : NM	0.000	0.148	Dec 2015	0.111		0.113	Oct 2017	-		0.113	Continuing	Continuing	Continuing
Discrimination Sensor Demonstrator Development - Information Management and Technology	C/CPAF	Northrop Grumman : CO	0.000	2.412		2.158		3.207	Feb 2018	-		3.207	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			0.000	5.365		11.351		12.099		-		12.099	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	18.362	57.382	73.295	-	73.295	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>
--	--	--

	Significant Event Complete ▲			Milestone Decision Complete ★			Element Test Complete ◆			System Level Test Complete ●			Complete Activity ◆									
	Significant Event Planned △			Milestone Decision Planned ☆			Element Test Planned ◇			System Level Test Planned ○			Planned Activity ◇									
	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022			
Advanced Sensor Contract Award																						
Compact, Advanced Sensor Tracking Ground Test																						
Advanced Sensor PDR																						
Advanced Sensor CDR																						
Advanced Sensor Flight Laboratory Test																						
Electro Optical Infrared (EOIR) Launch on Remote Track Ex																						
Advanced Sensor System Ground Test																						
Advanced Sensor CONUS Flight Test																						
Advanced Sensor Launch on Remote Test																						
Advanced Sensor Live Fire Track Ex for FEV-02																						
Advanced Sensor Discrimination																						
Advanced Sensor Engage on Remote																						
Space Advanced Sensor Contract Award																						
Space Advanced Sensor PDR																						
Space Advanced Sensor CDR																						
Space Advanced Sensor Launch Vehicle Purchase and Build																						
Advanced Sensor Kill Assessment Demo																						

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD99 / <i>Discrimination Sensor Demonstrator Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Advanced Sensor Contract Award	4	2016	4	2016
Compact, Advanced Sensor Tracking Ground Test	4	2016	4	2016
Advanced Sensor PDR	1	2017	1	2017
Advanced Sensor CDR	3	2017	3	2017
Advanced Sensor Flight Laboratory Test	1	2018	1	2018
Electro Optical Infrared (EOIR) Launch on Remote Track Ex	4	2017	4	2017
Advanced Sensor System Ground Test	1	2018	1	2018
Advanced Sensor CONUS Flight Test	2	2019	2	2019
Advanced Sensor Launch on Remote Test	3	2019	3	2019
Advanced Sensor Live Fire Track Ex for FEV-02	4	2019	4	2019
Advanced Sensor Discrimination	2	2020	2	2020
Advanced Sensor Engage on Remote	3	2020	3	2020
Space Advanced Sensor Contract Award	1	2020	1	2020
Space Advanced Sensor PDR	4	2020	4	2020
Space Advanced Sensor CDR	4	2021	4	2021
Space Advanced Sensor Launch Vehicle Purchase and Build	2	2022	3	2022
Advanced Sensor Kill Assessment Demo	4	2021	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MT99 / <i>Technology Maturation Initiatives Test</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT99: <i>Technology Maturation Initiatives Test</i>	-	2.070	13.508	0.220	-	0.220	4.476	4.327	1.857	0.000	0	26.458
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2016 to FY 2017 and subsequent decrease in FY2018 reflects differences in Discrimination Sensor flight-test participation. FY2016 funds MDA-configured MQ-9 participation in a single BMDS Test, FY2017 funds preparation for three tests, while FY2018 funds test analysis.

A. Mission Description and Budget Item Justification

Technology Maturation Initiatives (TMI) Test project funds the management and execution of TMI system participation in BMDS level tests, Hardware-in-the-Loop testing, and performance analysis costs for flight test data. This includes test asset shipment to test ranges, labor, travel, range support and Command Control Battle Management and Communications test support specific to Technology Maturation Initiatives.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Technology Maturation Initiatives Test	2.070	13.508	0.220
Articles:	-	-	-
<p>Description: This project captures the cost to test the systems developed under the Directed Energy Demonstrator Development and Discrimination Sensor Demonstrator Development projects under realistic conditions in conjunction with on-going BMDS testing and through dedicated live fire tests to inform continued testing, full development and limited fielding decisions. This effort also demonstrates potential sensors, systems, and architectures to integrate the BMDS for left and right of launch. Recurring efforts include:</p> <ul style="list-style-type: none"> - Conduct system level hardware-in-the-loop testing in conjunction with Enterprise Sensor Laboratory and Experimental Laboratory for a BMDS level test - Shipping, labor, travel, and range support for a BMDS level test <p>FY 2016 Accomplishments: SEE ABOVE</p> <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Complete test activities for an associated operations test, SCD Flight Test Standard Missile (SFTM)-02 - Complete test activities for a dedicated live fire test, Flight Experiment Advanced Technology (FEV)-01 - Complete preparation for Technology Maturation Initiatives ground and airborne sensor participation in hypersonic threat testing to investigate and demonstrate sensors and systems for integrating left and right of launch 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MT99 / <i>Technology Maturation Initiatives Test</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Prepare threat models for validation and conducted Hardware-in-the-Loop simulations and risk reduction flights to inform weapon concept definition and evaluation of this emerging threat			
FY 2018 Plans: - Complete residual support and data analysis for FEV-01 and FE-01.			
Accomplishments/Planned Programs Subtotals	2.070	13.508	0.220

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing

Remarks

D. Acquisition Strategy

The MDA Integrated Master Test Plan establishes and documents the test requirements for the BMDS with the specific focus on collecting the data needed for the Verification, Validation, and Accreditation of the BMDS models and simulations. This paradigm uses critical factor analysis to drive test design, planning, and execution for accrediting models & simulations, which is used to validate and assess system performance. With this test approach, the MDA will establish confidence that the models & simulations used to evaluate the BMDS represent real world behavior, thereby enabling simulation-based performance assessment to verify system functionality.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MT99 / <i>Technology Maturation Initiatives Test</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Technology Maturation Initiatives Test - Command Control Battle Management and Communications	Various	Northrop Grumman, Lockheed Martin, Space and Naval Warfare Center, National Air and Space Intelligence Center, Naval Surface Warfare Center Dahlgren Division : CO, CA, OH, VA	0.000	1.405	Jan 2016	5.224		0.220	Oct 2017	-		0.220	Continuing	Continuing	Continuing
Technology Maturation Initiatives Test - Pacific Missile Range Facility Test Prep	MIPR	Pacific Missile Range Facility : HI	0.000	0.000		0.124		0.000		-		0.000	Continuing	Continuing	Continuing
Technology Maturation Initiatives Test - Reagan Test Site Prep	MIPR	Reagan Test Site : Kwajalein Atoll	0.000	0.000		0.700		0.000		-		0.000	Continuing	Continuing	Continuing
Technology Maturation Initiatives Test - Transportation Costs for MQ-9	MIPR	US Air Force : CA	0.000	0.665	Mar 2016	3.060		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	2.070		9.108		0.220		-		0.220	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MT99 / <i>Technology Maturation Initiatives Test</i>
--	--	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Technology Maturation Initiatives Test - Airborne EO/IR Test	C/CPFF	General Atomics : CA	0.000	0.000		4.400		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		4.400		0.000		-		0.000	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	2.070	13.508	0.220	-	0.220	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MT99 / <i>Technology Maturation Initiatives Test</i>
--	--	--

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
Hardware in the Loop (HWIL), Shipping, Travel and Range Support for Pacific Dragon	◆	◆												
HWIL, Shipping, Travel and Range Support for SCD Flight Test Standard Missile (SFTM)-02			◇	◇										
HWIL, Shipping, Travel and Range Support for Flight Experiment Advanced Technology (FEV) - 01			◇	◇	◇	◇	◇							
HWIL, Shipping, Travel and Range Support for Flight Experiment Advanced Technology (FE) - 1					◇	◇								
HWIL, Shipping, Travel and Range Support for Flight Test Standard Missile 3 (FTM)-32								◇	◇					
HWIL, Shipping, Travel and Range Support for Flight Test Standard Missile 3 (FTM) - 24										◇	◇			
HWIL, Shipping, Travel and Range Support for FTM - 30											◇	◇		
HWIL, Shipping, Travel and Range Support for FEV-02										◇	◇	◇	◇	
HWIL, Shipping, Travel and Range Support for FTM - 38													◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MT99 / <i>Technology Maturation Initiatives Test</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Hardware in the Loop (HWIL), Shipping, Travel and Range Support for Pacific Dragon	2	2016	3	2016
HWIL, Shipping, Travel and Range Support for SCD Flight Test Standard Missile (SFTM)-02	2	2017	3	2017
HWIL, Shipping, Travel and Range Support for Flight Experiment Advanced Technology (FEV) - 01	1	2017	1	2018
HWIL, Shipping, Travel and Range Support for Flight Experiment Advanced Technology (FE) - 1	4	2017	1	2018
HWIL, Shipping, Travel and Range Support for Flight Test Standard Missile 3 (FTM)-32	2	2019	3	2019
HWIL, Shipping, Travel and Range Support for Flight Test Standard Missile 3 (FTM) - 24	2	2020	3	2020
HWIL, Shipping, Travel and Range Support for FTM - 30	3	2020	4	2020
HWIL, Shipping, Travel and Range Support for FEV-02	1	2020	4	2020
HWIL, Shipping, Travel and Range Support for FTM - 38	2	2021	3	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MC98 / <i>Cyber Operations</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC98: <i>Cyber Operations</i>	-	0.140	0.168	0.172	-	0.172	0.257	0.179	0.182	0.272	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Cyber Operations sustains the MDA DoD Risk Management Framework and Controls Validation Testing activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager Plans of Action and Milestones for the MDA Discrimination Sensor Technology mission systems. It maintains the Certification and Accreditation data repository, capturing the DoD Information Assurance Certification and Accreditation Program documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority accreditation decisions) and Plans of Action and Milestones on all MDA information systems.

This project monitors and tracks Cybersecurity mitigations detailed in Information Technology security Plans of Action and Milestones. Activities include preparation of Certification and Accreditation documentation and accreditation recommendations to the MDA Senior Information Assurance Officer /Certification Authority and Designated Approving Authority. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the project are necessary to comply with the Federal Information Security Management Act.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network / System Certification and Accreditation (C and A)	0.140	0.168	0.172
Articles:	-	-	-
Description: This project sustains the MDA DoD Risk Management Framework (RMF) certification and Controls Validation Testing activities for Technology Maturation Initiatives			
- Conduct cyber security and information assurance engineering and architecture planning for Technology Maturation Initiatives information technology systems			
- Plan and test the information assurance controls for Ballistic Missile Defense System Technology Maturation Initiatives systems			
- Develop Technology Maturation Initiatives DoD RMF certification and accreditation packages			
- Conduct Controls Validation Testing (CVT) for Technology Maturation Initiatives mission systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies			
- Conduct annual information assurance reviews on the Technology Maturation Initiatives enclaves to assess compliance in implementing and maintaining Information Assurance controls			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MC98 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Specific and/or unique accomplishments to a FY are as follows: <i>FY 2016 Accomplishments:</i> SEE ABOVE <i>FY 2017 Plans:</i> SEE ABOVE <i>FY 2018 Plans:</i> The increase in FY 2018 reflects the need for Information Assurance Controls Validation Testing recertification every three years.			
Accomplishments/Planned Programs Subtotals	0.140	0.168	0.172

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603177C: <i>Discrimination Sensor Technology</i>	27.981	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603178C: <i>Weapons Technology</i>	50.263	71.843	5.495	-	5.495	0.000	0.000	0.000	0.000	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603180C: <i>Advanced Research</i>	16.987	27.733	20.184	-	20.184	20.695	21.555	21.936	22.361	Continuing	Continuing

Remarks

D. Acquisition Strategy
The acquisition strategy for MC98, Cyber operations consists of using MDA civilian employees and the existing competitively awarded contractor support services.

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MC98 / <i>Cyber Operations</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C and A) - Agency Operations - Civilian Salaries and Travel	Allot	Missile Defense Agency : NM	0.000	0.140	Oct 2015	0.168	Oct 2016	0.172	Oct 2017	-		0.172	Continuing	Continuing	Continuing
Subtotal			0.000	0.140		0.168		0.172		-		0.172	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.140	0.168	0.172	-	0.172	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MC98 / <i>Cyber Operations</i>
--	--	--

	Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆											
	Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇											
	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
Cyber Security Support	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇				
Controls Validation Certification 1																△												
Controls Validation Certification 2																												△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MC98 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Cyber Security Support	1	2016	4	2021
Controls Validation Certification 1	3	2019	3	2019
Controls Validation Certification 2	3	2022	3	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program Wide Support</i>	-	4.171	4.564	6.620	-	6.620	9.691	9.092	9.604	9.710	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2016, Program Wide Support (PWS) was proportionately allocated to the Technology Maturation Initiatives Program Element. In FY 2017 and FY 2018, PWS reflects a proportional change as a result of an increase in Technology Maturation Initiatives.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	4.171	4.564	6.620
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: - Beginning in FY 2016, Program Wide support was redistributed across RDT&E Program Elements with a proportional allocation to the Technology Maturation Initiatives Program Element.			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	4.171	4.564	6.620

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency											Date: May 2017				
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>					Project (Number/Name) MD40 / <i>Program Wide Support</i>				

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, VA	0.000	0.000		0.091	Jul 2017	0.132	Jul 2018	-		0.132	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	0.000	4.171		4.473	Aug 2017	6.488	Aug 2018	-		6.488	Continuing	Continuing	Continuing
Subtotal			0.000	4.171		4.564		6.620		-		6.620	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.171	4.564	6.620	-	6.620	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / <i>Technology Maturation Initiatives</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	75.300	-	75.300	116.300	152.300	137.200	113.000	0	594.100
MD29: <i>Hypersonic Defense</i>	-	0.000	0.000	75.300	-	75.300	116.300	152.300	137.200	113.000	0	594.100

Program MDAP/MAIS Code: 362

Note

In accordance with FY 2017 NDAA direction for MDA to establish a program of record for Hypersonic Defense, this is a new PE in FY 2018. This is a continuation of efforts funded beginning in FY 2016, to include efforts in PE 0603890C budget project MD24, to assess architecture alternatives and provide recommendations for future BMDS configurations to keep pace with evolving advanced threats.

A. Mission Description and Budget Item Justification

This program element supports a focused program that includes executing the systems engineering process, full kill chain technology identification and maturation, providing analysis and assessment of target of opportunity events, and executing near term sensor and command and control capability upgrades to address defense from hypersonic threats, which pose a significant threat.

The Hypersonic Defense effort will develop and deliver a set of material solutions to address and defeat hypersonic threats informed by a set of near term technology demonstrations. Based on Department of Defense FY 2017 efforts to counter hypersonic threats, MDA will assess architecture alternatives and provide recommendations for future BMDS configurations to keep pace with evolving threats. An integrated set of enhancements provides incremental capability measured by progress and knowledge points in the following areas:

- Establishment of systems engineering needs, requirements, and architecture trade studies to identify alternative material solutions
- Modification of existing BMDS sensors and C2BMC element for hypersonic threats
- Definition of weapon concepts and investments in key technology to enable a broad set of solutions including kinetic and non-kinetic means both right and left of launch
- Execution of a series of sensor technology demonstrations, to include ground, airborne and space-based technology, to inform the development strategy

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	75.300	-	75.300
Total Adjustments	0.000	0.000	75.300	-	75.300
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	75.300	-	75.300

Change Summary Explanation

The increase in FY2018 from PB17 to PB18 supports emerging Department of Defense priorities:
 -- Establishment of a program or record for Hypersonic Defense, per FY 2017 NDAA direction (\$75.300 million)

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense				Project (Number/Name) MD29 / Hypersonic Defense			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD29: <i>Hypersonic Defense</i>	-	0.000	0.000	75.300	-	75.300	116.300	152.300	137.200	113.000	0	594.100
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In accordance with FY 2017 NDAA direction for MDA to establish a program of record for Hypersonic Defense, MD29 is a new budget project in FY 2018. This is a continuation of efforts funded beginning in FY 2016, to include efforts in PE 0603890C budget project MD24, to assess architecture alternatives and provide recommendations for future BMDS configurations to keep pace with evolving advanced threats.

A. Mission Description and Budget Item Justification

The Hypersonic Defense effort will develop and deliver a set of material solutions to address and defeat hypersonic threats informed by a set of near term technology demonstrations.

MDA will conduct systems engineering activities required to initiate development of BMDS capabilities to address advanced threats. Efforts will include architecture analysis activities such as a Defense Against Hypersonic Threats Analysis of Alternatives (AoA), jointly conducted with the Office of the Secretary of Defense, Cost Assessment and Program Evaluation, and Services with participation from the Combatant Commands.

MDA will leverage existing sensors and ground infrastructure/Command and Control to quickly demonstrate and deploy a three-phase limited contingency capability to provide real-time warning over the majority of the hypersonic threat profile. The initial limited contingency capability will be fully integrated into the C2BMC program of record. MDA plans to leverage the lessons learned and analysis from this capability development for the design and development of additional sensors for potential advanced threat applications.

To address the weapon technology required to defeat the hypersonic threat, MDA will focus on the development of weapon concepts through competitive development efforts with industry. The concepts and identified technology component risk reduction will formulate the trade space across cost, risk, and performance to inform the requirements development process. The Agency will also extend analysis tools to provide inputs to concept design and requirements development.

MDA will begin sensor demonstrations against hypersonic threats. The demonstrations build on ground, air, and space sensor technology to demonstrate capabilities to detect and track hypersonic threats. This initial demonstration will employ tracking capability in all three phases of flight: boost phase using overhead persistent infrared, mid-phase using airborne or space, and terminal phase using ground, airborne, or space tracking. MDA will also conduct pre and post demonstration performance assessment to analyze data collects. MDA plans to leverage the lessons learned and analysis from this demonstration for the design and development of a space sensor for potential hypersonic threat applications.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Hypersonic Defense	0.000	0.000	75.300
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD29 / <i>Hypersonic Defense</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<p>Description: This effort includes the systems engineering, technology development, and near term component capability development activities required to evolve the BMDS to address hypersonic threats, to include architecture analysis, capability roadmap development, and requirements development. It also includes an assessment of existing and new capabilities, identification, development, and demonstration of new technology and capabilities needed across the kill chain in support of architecture alternatives, and their ability to address advanced threats.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans: Systems Engineering: <ul style="list-style-type: none"> - Complete and deliver the Defense Against Hypersonic Threats Analysis of Alternatives (AoA) report - Conduct integrated architecture and performance analysis of end-to-end hypersonic threat capabilities based on the outcome of the AoA - Complete analysis and assessments of target of opportunity events - Draft capability roadmap - Complete requirements and initial system integration activities for near term capabilities - Draft initial requirements document Sensors Technology & Demonstration: <ul style="list-style-type: none"> - Identify and demonstrate sensor technology through: <ul style="list-style-type: none"> -- Dual airborne passive observation with stereo MDA configured MQ-9 Reapers -- Ground electro-optical/infrared and advanced sensor observations with a Multi-Spectral Targeting System (MTS)-C -- Pre and post mission performance analysis - Award technology demonstration contract - Purchase long lead component hardware required to build and test a sensor for future space applications - Conduct preliminary design of a space payload for future space applications Weapon Concept Definition: <ul style="list-style-type: none"> - Initiate development of innovative weapon concepts to address the hypersonic threat set - Deliver multiple initial concepts and identify technology risk reduction efforts </p>			
--	--	--	--

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD29 / <i>Hypersonic Defense</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Near Term Capability Development - Initiate design and development activities for prototype updates to various BMD sensor algorithms - Conduct design and development activities for C2BMC/BOA changes to provide limited tracking/display of the advanced threat.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	75.300

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603176C: <i>Advanced Concepts and Performance Assessment</i>	11.853	17.880	12.996	-	12.996	13.741	15.048	15.319	16.361	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing

Remarks

D. Acquisition Strategy

To optimize BMDS performance, MDA leverages the nation's engineering centers of excellence at government agencies, military Services, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry. The executing agents use varying contracting strategies in a flexible manner to maximize their contribution to the BMDS. MDA acquires products and services by competitive means to the extent that is possible and practical.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / Hypersonic Defense	Project (Number/Name) MD29 / Hypersonic Defense
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Hypersonic Defense - BMDS C2BMC/BOA Upgrades	C/Various	Various : AL	0.000	0.000		0.000		14.000	Nov 2017	-		14.000	Continuing	Continuing	Continuing
Hypersonic Defense - BMDS Sensor Upgrades	SS/CPFF	Raytheon : MA	0.000	0.000		0.000		4.100	Nov 2017	-		4.100	Continuing	Continuing	Continuing
Hypersonic Defense - Performance Assessment for Sensors and Weapons	MIPR	Various : AL	0.000	0.000		0.000		6.500	Nov 2017	-		6.500	Continuing	Continuing	Continuing
Hypersonic Defense - Sensor Technology	Allot	MDA : AL, NM	0.000	0.000		0.000		2.700	Oct 2017	-		2.700	Continuing	Continuing	Continuing
Hypersonic Defense - Sensor Technology - EO/IR Tracking Demonstration	C/CPFF	Various : AL, CA	0.000	0.000		0.000		3.277	Nov 2017	-		3.277	Continuing	Continuing	Continuing
Hypersonic Defense - Sensor Technology - OGA	MIPR	Various : AL	0.000	0.000		0.000		1.900	Nov 2017	-		1.900	Continuing	Continuing	Continuing
Hypersonic Defense - Sensor Technology - Space Sensor Concept and Development	C/CPIF	Various : AL	0.000	0.000		0.000		20.823	Nov 2017	-		20.823	Continuing	Continuing	Continuing
Hypersonic Defense - Systems Engineering	Allot	MDA : AL, VA	0.000	0.000		0.000		0.500	Oct 2017	-		0.500	Continuing	Continuing	Continuing
Hypersonic Defense - Systems Engineering - CSS	C/CPFF	TEAMS : AL, VA	0.000	0.000		0.000		2.000	Nov 2017	-		2.000	Continuing	Continuing	Continuing
Hypersonic Defense - Systems Engineering - FFRDC/UARC	MIPR	Various : VA, AL	0.000	0.000		0.000		2.000	Nov 2017	-		2.000	Continuing	Continuing	Continuing
Hypersonic Defense - Systems Engineering - Industry	C/CPAF	Boeing : AL	0.000	0.000		0.000		2.500	Nov 2017	-		2.500	Continuing	Continuing	Continuing
Hypersonic Defense - Weapon Concept Definition	C/CPFF	Various : AL	0.000	0.000		0.000		15.000	Apr 2018	-		15.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		75.300		-		75.300	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD29 / <i>Hypersonic Defense</i>
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	75.300	-	75.300	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD29 / <i>Hypersonic Defense</i>
--	---	--

	Significant Event Complete ▲			Milestone Decision Complete ★			Element Test Complete ◆			System Level Test Complete ●			Complete Activity ◆											
	Significant Event Planned △			Milestone Decision Planned ☆			Element Test Planned ◇			System Level Test Planned ○			Planned Activity ◇											
	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022					
Technology Development							◇	◇	◇	◇														
Concept Risk Reduction											◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇		
Proof of Concept																					◇	◇	◇	◇
Tracking Demonstration									△															
Concept Definition Contract Award										△														
AoA Completion										△														
Prototype Space Component Design Review										△														

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / <i>Hypersonic Defense</i>	Project (Number/Name) MD29 / <i>Hypersonic Defense</i>
--	---	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Development	1	2018	4	2018
Concept Risk Reduction	1	2019	4	2021
Proof of Concept	1	2022	4	2022
Tracking Demonstration	1	2018	1	2018
Concept Definition Contract Award	3	2018	3	2018
AoA Completion	3	2018	3	2018
Prototype Space Component Design Review	4	2018	4	2018

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604873C / <i>Long Range Discrimination Radar (LRDR)</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	49.606	132.278	173.162	357.659	-	357.659	135.187	52.218	50.843	119.803	Continuing	Continuing
MC96: <i>Cyber Operations</i>	-	5.600	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	5.600
MD96: <i>Long Range Discrim Radar (LRDR)</i>	49.606	115.619	161.353	341.638	-	341.638	128.689	49.792	48.388	114.071	Continuing	Continuing
MD40: <i>Program Wide Support</i>	-	11.059	11.809	16.021	-	16.021	6.498	2.426	2.455	5.732	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The mission of the Long Range Discrimination Radar (LRDR) program office is to define, develop, acquire, field, and sustain the LRDR as an element of the BMDS supporting robust homeland defense (RHD). Initial fielding of the LRDR Configuration 1 is planned for 2020 with an Operational Capability Declaration projected in the 2022 time frame. The LRDR provides persistent long-range midcourse discrimination, precision tracking and hit assessment to support the RHD Capability against long-range missile threats in the Pacific theater. The LRDR is comprised of a LRDR Equipment Shelter (LES), housing two radar array faces, a Mission Control Facility (MCF) which supports radar operations, and supporting facilities and infrastructure. The Secretary of the Air Force approved Clear Air Force Station, Alaska as the LRDR site. The Air Force Space Command (AFSPC) has been designated as the Lead MAJCOM.

The LRDR operates in S-band frequencies, features scalable and open systems architecture to mitigate evolving threats, and is integrated into the BMDS through the C2BMC system. This Program Element includes BMDS threat discrimination improvements, which will enhance BMDS effectiveness against the evolving threat. The end result will be a BMDS architecture more capable of discriminating and destroying re-entry vehicles with a higher degree of confidence, improving Warfighter shot doctrine, which will conserve homeland defense interceptor inventory. LRDR also supports additional mission areas including Space Situational Awareness.

FY 2017 Amended Budget Request Justification: \$+11.150M is required to address emergency warfighting readiness requirements to ensure readiness of the BMDS. \$+11.150M Project MD96-LRDR/Long Range Discrimination Radar to purchase and install Front End Electronics (FEE) on the LRDR Primary Array to improve MDA's ability to adapt and mitigate threat growth with additional sensitivity without radar down time. Also improves system performance by reducing field installation cost (increased flexibility/supportability). Funds also provide removal of Polychlorinated Biphenyl-contaminated paint on structural steel encountered in Ballistic Missile Early Warning System (BMEWS) buildings (receive antennas not affected) in preparation for construction of LRDR.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604873C / <i>Long Range Discrimination Radar (LRDR)</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	137.564	162.012	310.347	-	310.347
Current President's Budget	132.278	173.162	357.659	-	357.659
Total Adjustments	-5.286	11.150	47.312	-	47.312
• Congressional General Reductions	-0.788	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-1.500	0.000			
• SBIR/STTR Transfer	-2.998	0.000			
• Other Adjustment	0.000	11.150	47.312	-	47.312

Change Summary Explanation

The increase in FY2018 from PB17 to PB18 reflects a realignment of the baselined LRDR schedule and contract spend plan for long lead time material (LLTM) for design critical components.

FY 2017 Amended Budget Request Justification: \$+11.150M is required to address emergency warfighting readiness requirements to ensure readiness of the BMDS.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MC96 / Cyber Operations
--	--	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC96: <i>Cyber Operations</i>	-	5.600	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	5.600
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Funding allocated in FY16 to comply with the emerging cybersecurity requirements directed by the Secretary of Defense (SECDEF) Cybersecurity Discipline Implementation Plan.

A. Mission Description and Budget Item Justification

To comply with the Secretary of Defense (SECDEF) Cybersecurity Discipline Implementation Plan, MDA funded cybersecurity efforts towards executing the four Lines of Effort. MDA made significant progress in FY16 toward the following efforts within the Protecting Networks and Information cyber taxonomy.

1. Strong Authentication necessary to degrade the adversaries' ability to maneuver on DoD information Networks. MDA continues to implement strong authentication to reduce anonymity and improve the security posture of MDA networks.
2. Device hardening required to reduce internal and external attack vectors into DoD information networks. MDA made progress toward reducing vulnerabilities and weaknesses in hardware and software that could comprise MDA networks.
3. Reduce the attack surface required to decrease external attack vectors into DoD information networks. MDA reviewed, reported and removed Internet-facing assets that no longer have a mission requirement from the MDA networks.
4. Alignment to cybersecurity / computer network defense service providers. MDA is making progress toward moving to a more agile and defensible cybersecurity strategy posture. Additionally, MDA is aligning networks under the MDA Computer Network Defense Service Provider (CNDSP).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Protecting Networks and Information	5.600	0.000	0.000
Articles:	-	-	-
Description: This budget project initiates compliance with the Secretary of Defense (SECDEF) Cybersecurity Discipline Implementation Plan.			
FY 2016 Accomplishments: SEE ABOVE			
FY 2017 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / <i>Long Range Discrimination Radar (LRDR)</i>	Project (Number/Name) MC96 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	5.600	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MC96 / Cyber Operations
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Protecting Networks and Information - Protecting Networks and Information	C/CPAF	Northrop Grumman : AL, CO, VA	0.000	5.600	Jun 2016	0.000		0.000		-		0.000	0	5.600	5.600
Subtotal			0.000	5.600		0.000		0.000		-		0.000	0.000	5.600	5.600

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.600	0.000	0.000	-	0.000	0.000	5.600	5.600

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / <i>Long Range Discrimination Radar (LRDR)</i>	Project (Number/Name) MC96 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Protecting Networks and Information	3	2016	4	2016

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)				Project (Number/Name) MD96 / Long Range Discrim Radar (LRDR)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD96: Long Range Discrim Radar (LRDR)	49.606	115.619	161.353	341.638	-	341.638	128.689	49.792	48.388	114.071	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

This project provides for the development and initial fielding of a LRDR by 2020 to provide an improved persistent midcourse BMDS discrimination capability in the Pacific sensor architecture. The LRDR will also increase the defensive capacity of the Ground-Based Midcourse Defense (GMD) interceptor inventory and address evolving threats. MDA's request includes funding for the design and development of the LRDR, delivery of spares for initial fielding, system engineering, software development, software Independent Verification and Validation, hardware manufacturing, qualification testing, developmental testing support and Modeling and Simulation (M&S) efforts. M&S includes development of LRDR digital simulations and their integration into the BMDS, M&S architecture, and Verification, Validation, and Accreditation of LRDR models. The inherent capabilities of the LRDR will be leveraged to support auxiliary missions, including augmentation of United States Air Force (USAF) Space Surveillance and Space Situational Awareness capabilities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Long Range Discrimination Radar (LRDR)	115.619	161.353	341.638
Articles:	-	-	-
<p>Description: The LRDR program includes requirement development activities associated with systems engineering, software development, discrimination improvements, design reviews, testing, and Models and Simulation (M&S) efforts for radar development. Efforts include LRDR site activation and preparation of site infrastructure for construction activities. The program will develop and integrate Command, Control, Battle Management, and Communications (C2BMC) systems for LRDR functionality. The program will develop and deliver radar software Build 1 and establish the Independent Verification and Validation (IV&V) lab for testing of operational software. The program includes purchase, manufacture, and test of long lead components. Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Completed the LRDR program System Requirements Review (SRR) -Completed the LRDR contract Integrated Baseline Review (IBR) -Initiated preparations for system-level Preliminary Design Review (PDR) -Initiated support for the CAPE's Independent Cost Estimate (ICE) -Initiated purchase of prototype hardware and long-lead items 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD96 / Long Range Discrim Radar (LRDR)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>-Completed the MILCON 65% Facilities Design Review -Completed MILCON 95% Facilities Design Review -Completed environmental, geotechnical, and other studies for environmental compliance and to inform military construction (MILCON) design effort</p> <p>FY 2017 Plans: -Initiate LRDR program transition from the design phase to the production and integration phase. Critical Design Reviews (CDRs) will be conducted and parts will be ordered based on the approved designs. -Conduct system-level PDR -Conduct system-level CDR at the component, subsystem and system level -Initiate preparations for system-level Final Design Review (FDR) -Conduct the Developmental Baseline Review (DBR) after PDR and completion of the ICE, in accordance with acquisition standards and program schedule that was briefed to OSD, AT&L -Initiate establishment and implementation of initial physical and electronic security services -Initiate the purchase and installation of Front End Electronics (FEE) on the LRDR Primary Array to improve MDA's ability to adapt and mitigate threat growth with additional sensitivity without radar down time -Initiate environmental remediation of Ballistic Missile Early Warning System (BMEWS) at Clear Air Force Station, Alaska</p> <p>FY 2018 Plans: -Complete design and purchase hardware: --Conduct system Final Design Review (FDR) and initiate purchasing of design critical components for the Sub-Array Suites (SAS), Radar Processing Group (RPG), and Mission Processing Group (MPG) --Purchase and receive radar material to include: Transmit Receive (T/R) modules, Wide Band Limiter (WBLR) modules, T/R Low Power Module Circuit Card Assemblies (CCAs), T/R High Power Module CCAs, Power Line Replaceable Units (LRUs), Digital Receiver / Exciter (DREX) LRUs, DREX Radio Frequency (RF) CCAs, DREX Processor CCAs, Column Processors, Long Lead Column Processor CCAs, Subarray Suite Assembly materials, and Synthesizer Cabinets -Initiate qualification and sub-system testing: --Initiate Environmental Qualification testing, Electro-Magnetic Interference (EMI) testing and SAS calibration testing on the LRDR Integration Site (LIS) --Complete Highly Accelerated Life Test (HALT) of radar array power systems -Initiate manufacturing and assembly on Array #1 and #2 and begin Factory Acceptance Testing on Array #1: --Conduct manufacturing review for Sub-Array Suites (SAS) and Front End Electronics (FEE) --Assemble components to include: DREX LRUs, T/R LRUs, Power Supply LRUs, Panel Structure, Radiating Tiles, Circulator CCAs, and Beamformer LRUs --Initiate final SAS and FEE assembly</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD96 / Long Range Discrim Radar (LRDR)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
--Deliver Technical Data Package			
--Deliver 100% Design Drawings for Construction			
-Complete development and delivery of software Build 1 and transition to software maintenance:			
--Conduct SW Test Readiness Review (TRR), complete and deliver software Build 1, integrate Build 1 into government IV&V lab and test the operational software build			
--Deliver Final cyber security mitigation software and final version of diagnostic / evaluation software			
--Deliver Active Electronic Steered Area (AESA) Radio Frequency (RF) model			
-Continue operations support for the LRDR Program Office			
Accomplishments/Planned Programs Subtotals	115.619	161.353	341.638

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603882C: Ballistic Missile Defense Midcourse Defense Segment	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: Ballistic Missile Defense Sensors	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603884C: SENSORS MILCON	0.000	166.670	0.000	-	0.000	150.000	0.000	212.000	0.000	0	528.670
• 0603896C: Ballistic Missile Defense Command and Control, Battle Management & Communication	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603904C: Missile Defense Integration and Operations Center (MDIOC)	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: Sea Based X-Band Radar (SBX)	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0604879C: Ballistic Missile Defense Sensor Test	83.597	83.250	84.239	-	84.239	65.886	76.218	68.231	56.579	Continuing	Continuing
• 31299903: MILCON PLANNING and DESIGN	15.000	0.000	0.000	-	0.000	15.184	36.140	16.248	8.009	0	90.581

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD96 / Long Range Discrim Radar (LRDR)
--	--	--

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
------------------	----------------	----------------	-------------------------------	------------------------------	--------------------------------	----------------	----------------	----------------	----------------	-----------------------------------	-------------------

Remarks

D. Acquisition Strategy

The LRDR acquisition strategy was approved on 7 January 2015 which incorporates robust acquisition practices to ensure delivery of a best value solution that meets mission performance requirements and reduces lifecycle costs. A fixed-price incentive contract was awarded to Lockheed Martin Corporation of Moorestown, New Jersey on October 21, 2015 to manage, develop, build and integrate, test, and field the LRDR prime mission equipment. The prime contract included other fixed-price and cost-reimbursable line items and options in order to properly balance acquisition costs and risks. Performance and cost incentives were included to motivate contractor performance. The radar prime contractor will deliver a full technical data package, which will enable the government to effectively and affordably sustain the system. MDA will synchronize the radar development contract efforts with a simultaneous MILCON effort which will be executed through the US Army Corps of Engineers. The LRDR is expected to complete development and initial fielding in 2020 for BMDS integration and testing.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD96 / Long Range Discrim Radar (LRDR)
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Long Range Discrimination Radar (LRDR) - Communications Integration	C/TBD	GTRI, LM, JHU : GA, CO, MD	0.000	10.350	Feb 2016	4.000	May 2017	10.000	May 2018	-		10.000	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - IV&V	MIPR	AMRDEC : Huntsville, AL	0.000	2.438	Jan 2016	3.700	Nov 2016	3.100	Nov 2017	-		3.100	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Prime Contractor	C/FPIF	Lockheed Martin : Moorestown, NJ	35.500	73.812	Feb 2016	139.653	Nov 2016	309.981	Nov 2017	-		309.981	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Site Activation & Studies	C/TBD	MDA : AL	14.106	29.019	Jun 2016	14.000	Feb 2017	18.557	Feb 2018	-		18.557	Continuing	Continuing	Continuing
Subtotal			49.606	115.619		161.353		341.638		-		341.638	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	49.606	115.619	161.353	341.638	-	341.638	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD96 / Long Range Discrim Radar (LRDR)
--	--	--

	Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆											
	Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇											
	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
Long Range Discrimination Radar Capability	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
System Requirements Review (SRR)	▲																											
Technical Baseline Review (TBR)			★																									
Preliminary Design Review (PDR)						△																						
Developmental Baseline Review (DBR)							☆																					
Critical Design Review (CDR)								△																				
Build 1 Software Delivery											△																	
FTX-27 (SN, Target Only Flight Test)															△													
Initial Fielding																				△								
GTI-08 (N/P)(BMDS Ground Test)																		◇	◇									
Technical Capability Declaration (TCD)																				△								
GTD-08 (N/P) (BMDS Ground Test)																				◇								
FTX-26 (SN, Target Only Flight Test)																								△				

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / <i>Long Range Discrimination Radar (LRDR)</i>	Project (Number/Name) MD96 / <i>Long Range Discrim Radar (LRDR)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Long Range Discrimination Radar Capability	1	2016	4	2022
System Requirements Review (SRR)	2	2016	2	2016
Technical Baseline Review (TBR)	3	2016	3	2016
Preliminary Design Review (PDR)	2	2017	2	2017
Developmental Baseline Review (DBR)	3	2017	3	2017
Critical Design Review (CDR)	4	2017	4	2017
Build 1 Software Delivery	3	2018	3	2018
FTX-27 (SN, Target Only Flight Test)	4	2019	4	2019
Initial Fielding	1	2021	1	2021
GTI-08 (N/P)(BMDS Ground Test)	2	2020	3	2020
Technical Capability Declaration (TCD)	1	2021	1	2021
GTD-08 (N/P) (BMDS Ground Test)	1	2021	1	2021
FTX-26 (SN, Target Only Flight Test)	3	2021	3	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD40 / Program Wide Support
--	--	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: Program Wide Support	-	11.059	11.809	16.021	-	16.021	6.498	2.426	2.455	5.732	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2016, Program Wide Support (PWS) was proportionately allocated to Long Range Discrimination Radar (LRDR). In FY 2017 and FY 2018, PWS reflects a proportional change as a result of an increase to LRDR.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	11.059	11.809	16.021
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: - Beginning in FY 2016, Program Wide Support was redistributed across RDT&E Program Elements with a proportional allocation to LRDR.			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	11.059	11.809	16.021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD40 / Program Wide Support
--	--	---

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD40 / Program Wide Support
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance SRM (MIPR)	MIPR	Various : Multi: AL, VA, Aust, Japan	0.000	5.709		6.050	Nov 2016	9.153	Nov 2017	-		9.153	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	0.000	0.224		0.236	Jul 2017	0.320	Jul 2018	-		0.320	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	Various : MDA Multi: AL, CO, CA, VA	0.000	5.126		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	0.000	0.000		5.523	Jul 2017	6.548	Jul 2018	-		6.548	Continuing	Continuing	Continuing
Subtotal			0.000	11.059		11.809		16.021		-		16.021	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	11.059	11.809	16.021	-	16.021	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / Long Range Discrimination Radar (LRDR)	Project (Number/Name) MD40 / Program Wide Support

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604874C I Improved Homeland Defense (HLD) Interceptors
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	97.739	282.864	274.148	465.530	-	465.530	496.414	532.984	635.749	627.388	Continuing	Continuing
MD97: Improved HD Interceptors	97.739	270.780	260.543	448.160	-	448.160	472.098	506.467	603.371	596.701	Continuing	Continuing
MD40: Program Wide Support	-	12.084	13.605	17.370	-	17.370	24.316	26.517	32.378	30.687	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Increase from FY 2017 to FY 2018 is due to buildup of Redesigned Kill Vehicle (RKV) components and extensive testing in support of component level and system level Critical Design Reviews (CDR) as well as additional funding to continue the RKV Alternative Seeker development effort.

A. Mission Description and Budget Item Justification

The Ground-based Midcourse Defense (GMD) element of the Ballistic Missile Defense System (BMDS) provides combatant commanders with a continuously available (24 hours a day, 365 days a year) capability to defend the Homeland against limited Intercontinental Ballistic Missile (ICBM) attacks. The improved Homeland Defense interceptor includes a Redesigned Kill Vehicle (RKV), an improved booster (C3), and All Up Round (AUR) engineering necessary to integrate the RKV with new and existing booster configurations. The RKV improves interceptor reliability, reduces unit cost, improves maintainability in the field, and improves performance against emerging threats.

The C3 booster improves survivability against lightning and threat environments. AUR engineering enables an initial operational capability of RKV integration with existing C1 and C2 boosters and flight testing. When C3 development completes, AUR engineering enables full operational capability of RKV integration with the C3 booster.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	278.944	274.148	321.441	-	321.441
Current President's Budget	282.864	274.148	465.530	-	465.530
Total Adjustments	3.920	0.000	144.089	-	144.089
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	9.999	0.000			
• SBIR/STTR Transfer	-6.079	0.000			
• Other Adjustment	0.000	0.000	144.089	-	144.089

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604874C <i>I Improved Homeland Defense (HLD) Interceptors</i>
---	---

Change Summary Explanation

The increase in FY2018 from PB17 to PB18 reflects a buildup of RKV components and extensive testing in support of component level and system level Critical Design Reviews (CDR), additional funding to continue the RKV Alternative Seeker development effort and to begin work to ensure no fewer than 44 GBIs are deployed through the FYDP.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604874C / Improved Homeland Defense (HLD) Interceptors				Project (Number/Name) MD97 / Improved HD Interceptors			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD97: Improved HD Interceptors	97.739	270.780	260.543	448.160	-	448.160	472.098	506.467	603.371	596.701	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2017 to FY 2018 is due to buildup of RKV components and extensive testing in support of component level and system level Critical Design Reviews (CDR) as well as additional funding to continue the RKV Alternative Seeker development effort.

A. Mission Description and Budget Item Justification

The Ground-based Midcourse Defense (GMD) element of the Ballistic Missile Defense System (BMDS) provides combatant commanders with a continuously available (24 hours a day, 365 days a year) capability to defend the Homeland against limited Intercontinental Ballistic Missile (ICBM) attacks. The improved Homeland Defense interceptor includes a Redesigned Kill Vehicle (RKV, an improved booster (C3, and All Up Round (AUR engineering necessary to integrate the RKV with new and existing booster configurations. The Redesigned Kill Vehicle (RKV) improves interceptor reliability, reduces unit cost, improves maintainability in the field, and improves performance against emerging threats. The C3 booster improves survivability against lightning and threat environments. AUR engineering enables an initial operational capability of RKV integration with existing C1 and C2 boosters and flight testing. When C3 development completes, AUR engineering enables full operational capability of RKV integration with the C3 booster.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Improved Homeland Defense (HLD) Interceptor Development	257.898	247.124	435.934
Articles:	-	-	-
Description: HLD development objectives include: redesigning the GMD kill vehicle, implementing tactical booster modifications, and conducting All-Up Round (AUR) system engineering. The RKV will be built with a modular, open architecture and designed with common interfaces and standards, making upgrades easier and broadening MDA's vendor and supplier base. The design for growth allows future upgradability. The Configuration 3 integrated boost vehicle will incorporate enhanced lightning protection, power transient protection, and survivability enhancements. The AUR development approach integrates the RKV with three different 3-stage boost vehicle configurations: C1, C2, and C3. The goal of all of these efforts is to develop and field an integrated set of capabilities to improve the reliability, lethality, and discrimination to defeat future threats, and to begin work to ensure no fewer than 44 GBIs are deployed through the FYDP			
FY 2016 Accomplishments:			
-Completed System Requirements Review (SRR) including objective evidence documentation and analysis			
-Continued to provide Task Instructions to enable Industry Team development of RKV hardware			
-Continued material purchases in support of development activities, design verification testing and initial flight testing			
-Continued material purchases in support of hardware-in-the-loop capability at the RKV Development Laboratory (RDL)			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / <i>Improved Homeland Defense (HLD) Interceptors</i>	Project (Number/Name) MD97 / <i>Improved HD Interceptors</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>-Completed component-level and system SRRs</p> <p>-Initiated preparations for Preliminary Design Reviews (PDRs) and system-level PDR</p> <p>-Initiated development of special tooling and other special test equipment</p> <p>-Ordered long lead hardware for Design Verification Testing</p> <p>-Initiated Electromagnetic Environmental Effects (E3) testing, thermal testing, vibration and shock environments testing and Highly Accelerated Lifecycle Testing as part of the Design Verification Testing program</p> <p>-Continued requirements development, engineering analysis, capability integration, and performance verification for RKV development</p> <p>-Initiated modeling and simulation development and integration to assess component and system performance in support of annual technical assessments</p> <p>FY 2017 Plans:</p> <p>-Continue long lead material purchases for qualification and flight test articles in order to support early testing and evaluation to ensure RKV meets reliability, producibility, modularity and performance requirements</p> <p>-Initiate testing and development efforts associated with the RKV design to include module design verification, qualification, and survivability tests, integrated kill vehicle qualification tests, and BMDS ground tests</p> <p>-Continue development of kill vehicle algorithms and software, and conduct software independent verification and validation testing at contractor and government facilities</p> <p>-Continue development, conduct design reviews, and begin acquisition of qualified long lead items for the integrated 3-Stage boost vehicle, Configuration 3 (C3) that incorporates enhanced lightning protection; power transient protection, survivability enhancements, and a system selectable 2-stage mode capability for integration into the operational fleet</p> <p>-Initiate the Post-Intercept Assessment (PIA) capability, which will allow the warfighter to know whether engagements were successful, modify firing doctrine as needed, and determine whether or not to re-engage. Implementation of PIA could reduce the number of GBIs required to defeat a threat</p> <p>-Continue AUR development and build two flight test units to support the testing and fielding of RKV and C3 equipped interceptors</p> <p>-Continue requirements development, engineering analysis, capability integration, and performance verification for RKV development</p> <p>-Continue modeling and simulation development and integration to assess component and system performance in support of annual technical assessments</p> <p>FY 2018 Plans:</p> <p>-Increase from FY 2017 to FY 2018 is due to buildup of RKV components and extensive testing in support of component level and system level Critical Design Reviews (CDR), additional funding to continue the RKV Alternative Seeker development effort, and to begin work to ensure no fewer than 44 GBIs are deployed through the FYDP</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / <i>Improved Homeland Defense (HLD) Interceptors</i>	Project (Number/Name) MD97 / <i>Improved HD Interceptors</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>-Complete module and payload critical design reviews to establish the product baseline to ensure the RKV has a reasonable expectation of satisfying the RKV Performance Specification</p> <p>-Conduct an initial IFICS End-to-End Test to demonstrate preliminary communication capability between the RKV and the GMD Ground System</p> <p>-Conduct Integrated Communications Radio KV to KV Integration to demonstrate and validate the design approach of the new RKV communication capability</p> <p>-Conduct Production Highly Accelerated Life Testing to support RKV reliability improvements, identify stable operating and destruct limits, and improve the probability of first pass success during qualification</p> <p>-Conduct KV to KV Antenna demonstrations to characterize engineering parameters, gather data and validate the design approach of the new RKV communication capability</p> <p>-Complete buildup of the qualification unit for testing to demonstrate satisfaction of design requirements to support readiness for flight test and manufacturing</p> <p>-Continue modeling and simulation development and integration to assess RKV performance in preparation for flight test and support of GMD and BMDS assessments</p> <p>-Continue development of kill vehicle algorithms and software, and conduct software independent verification and validation testing at contractor and government facilities to conduct independent testing and analysis ensuring the RKV software meets its requirements and that the delivered software system satisfies requirements, the intended use, and warfighter needs</p> <p>-Continue AUR systems engineering to support the testing and fielding of RKV and C1, C2, and C3 equipped interceptors in order to support an uninterrupted fleet of 44 emplaced GBIs for the warfighter</p> <p>-Complete AUR Preliminary Design and Critical Design and support development of the first RKV flight test (CTV-03) to demonstrate RKV integration and performance in flight test</p>			
<p>Title: Program Operations</p> <p align="right">Articles:</p> <p>Description: Program Operations provides for integrated program management of the Improved Homeland Defense Interceptor efforts. Included in this effort are program and business management, program administration, technical and testing oversight, verification of hardware and software development, quality / safety / mission assurance, integrated logistics support, and government manpower and infrastructure to develop, test and sustain the RKV.</p> <p>FY 2016 Accomplishments:</p> <p>-Performed technical and business management support, financial management, cost and schedule performance analysis, cost estimation and analysis, configuration management, and integration activities to ensure the program meets cost, schedule, and performance goals</p>	12.882 -	13.419 -	12.226 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / <i>Improved Homeland Defense (HLD) Interceptors</i>	Project (Number/Name) MD97 / <i>Improved HD Interceptors</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-Ensured Ground-based Midcourse Defense (GMD) RKV program compliance with internal and external direction, policies, and regulations to deliver critical capability via a consistent and disciplined process</p> <p>-Provided a Mission Assurance and Manufacturing Engineering Program to include quality, configuration management, manufacturing, engineering, and safety in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs</p> <p>-Completed development of a system Work Breakdown Structure</p> <p>FY 2017 Plans:</p> <p>-Provide technical and business management support, financial management, cost and schedule performance analysis, cost estimation and analysis, configuration management, and integration activities, to ensure the program meets cost, schedule, and performance goals</p> <p>-Ensure Ground-based Midcourse Defense (GMD) RKV program compliance with internal and external direction, policies, and regulations to deliver critical capability via a consistent and disciplined process</p> <p>-Provide a Mission Assurance and Manufacturing Engineering Program to include quality, configuration management, manufacturing, engineering, and safety in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs</p> <p>FY 2018 Plans:</p> <p>-Decrease from FY 2017 to FY 2018 reflects reduced contract spending for Mission Support Services in accordance with Department Service Requirement Review Board reductions through increased competition.</p> <p>-Provide technical and business management support, financial management, cost and schedule performance analysis, cost estimation and analysis, configuration management, and integration activities, to ensure the program meets cost, schedule, and performance goals</p> <p>-Ensure Ground-based Midcourse Defense (GMD) RKV program compliance with internal and external direction, policies, and regulations to deliver critical capability via a consistent and disciplined process</p> <p>-Provide a Mission Assurance and Manufacturing Engineering Program to include quality, configuration management, manufacturing, engineering, and safety in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs</p>				
Accomplishments/Planned Programs Subtotals		270.780	260.543	448.160

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / Improved Homeland Defense (HLD) Interceptors	Project (Number/Name) MD97 / Improved HD Interceptors
--	--	---

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0203882C: MD08: GMD O&M	0.000	129.281	137.896	-	137.896	143.027	139.319	142.269	145.188	Continuing	Continuing
• 0603882C: Ballistic Missile Defense Midcourse Defense Segment	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603914C: Ballistic Missile Defense Test	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: Ballistic Missile Defense Targets	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing
• 0604887C: Ballistic Missile Defense Midcourse Defense Segment Test	54.619	56.481	76.757	-	76.757	74.205	69.713	77.826	79.094	Continuing	Continuing

Remarks

D. Acquisition Strategy

MDA is executing an acquisition strategy to develop an integrated RKV with a Cross-Industry team design solution. This concept includes potential production sources from industry and provides a consolidated product that includes the collective knowledge of and leverages capabilities from the industry leaders in kill vehicle design and development. The industry teaming method incorporates the most viable technical approaches from each contractor and allows for combination of resources to shorten the learning curve and reduce the time needed to develop and begin initial production. This strategy allows for industry to provide the best value and best design solution for the MDA while setting the conditions for future competition of production. The development phase is followed by initial production and then a competitive full rate production phase. The competitive production phase encompasses the purchase, production, and the integration of the proven components demonstrated in the development phase and provides competitive benefits to the Government. This strategy allows for industry to provide the best value and best design solution for the MDA while setting the conditions for future competition of production. The Government, as the design authority, retains responsibility for the execution of the program cost, schedule, and the technical performance of the RKV to meet requirements levied on the contractor. The Government has implemented a rigorous systems engineering process to ensure that the design and development efforts meet requirements. The MDA goal is to field the initial production RKV's to recap existing CE-I GBIs and support follow-on BMDS test events by FY2022. This acquisition strategy is documented in the RKV Acquisition Plan signed by the Defense Acquisition Executive in October 2015.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / Improved Homeland Defense (HLD) Interceptors	Project (Number/Name) MD97 / Improved HD Interceptors
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Operations - Contract Support Services	C/CPFF	Various AL/AK/ : CA/CO/VA	4.510	7.053	Oct 2015	6.141	Oct 2016	6.101	Oct 2017	-		6.101	Continuing	Continuing	Continuing
Program Operations - FFRDC Support	MIPR	MIT : LL AL	1.138	1.994	Nov 2015	1.501	Nov 2016	0.426	Nov 2017	-		0.426	Continuing	Continuing	Continuing
Program Operations - Government Civilian Salaries	MIPR	MDA : AL/VA	1.714	2.144	Oct 2015	3.363	Oct 2016	2.428	Oct 2017	-		2.428	Continuing	Continuing	Continuing
Program Operations - Other Government Agencies	MIPR	Various AL/VA : FL/CO	1.767	1.411	Oct 2015	2.043	Oct 2016	2.996	Oct 2017	-		2.996	Continuing	Continuing	Continuing
Program Operations - Prior year no longer funded in the FYDP	Various	Various : Various	0.552	0.000		0.000		0.000		-		0.000	0	0.552	0
Program Operations - Travel	MIPR	MDA : AL/VA	0.180	0.280	Oct 2015	0.371	Oct 2016	0.275	Oct 2017	-		0.275	Continuing	Continuing	Continuing
Subtotal			9.861	12.882		13.419		12.226		-		12.226	-	-	-

Remarks
N/A

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Improved Homeland Defense (HLD) Interceptor Development - Configuration 3 Booster Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		20.802	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Improved Homeland Defense (HLD) Interceptor Development - PRIME	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		0.000		52.032	Nov 2017	-		52.032	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / Improved Homeland Defense (HLD) Interceptors	Project (Number/Name) MD97 / Improved HD Interceptors
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AUR System Engineering and Development															
Improved Homeland Defense (HLD) Interceptor Development - PRIME RKV Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	51.714	246.013	Nov 2015	199.783	Nov 2016	351.371	Nov 2017	-		351.371	Continuing	Continuing	Continuing
Improved Homeland Defense (HLD) Interceptor Development - Post-Intercept Assessment	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		7.650	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Improved Homeland Defense (HLD) Interceptor Development - Prior year no longer funded in the FYDP	Various	Various : Various	21.114	0.000		0.000		0.000		-		0.000	0	21.114	0
Improved Homeland Defense (HLD) Interceptor Development - RKV Development Lab and System Support	MIPR	AMRDEC : Redstone Arsenal, AL	15.050	11.885	Nov 2015	18.889	Nov 2016	32.531	Nov 2017	-		32.531	Continuing	Continuing	Continuing
Subtotal			87.878	257.898		247.124		435.934		-		435.934	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	97.739	270.780	260.543	448.160	-	448.160	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / Improved Homeland Defense (HLD) Interceptors	Project (Number/Name) MD97 / Improved HD Interceptors
--	--	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
System Requirements Review	★													
Preliminary Design Review (PDR)			☆											
Key Component Critical Design Review (CDR)					☆									
Critical Design Review (CDR)						☆								
Complete Qualification Test								△						
GM CTV-03 (GM, Non-Intercept Flight Test)									△					
FTG-17 (IOT&E) (GM, Intercept Flight Test)											△			
FTG-18 (GM, Intercept Flight Test)														△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / <i>Improved Homeland Defense (HLD) Interceptors</i>	Project (Number/Name) MD97 / <i>Improved HD Interceptors</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
System Requirements Review	1	2016	1	2016
Preliminary Design Review (PDR)	2	2017	2	2017
Key Component Critical Design Review (CDR)	4	2018	4	2018
Critical Design Review (CDR)	1	2019	1	2019
Complete Qualification Test	4	2019	4	2019
GM CTV-03 (GM, Non-Intercept Flight Test)	1	2020	1	2020
FTG-17 (IOT&E) (GM, Intercept Flight Test)	1	2021	1	2021
FTG-18 (GM, Intercept Flight Test)	1	2022	1	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / Improved Homeland Defense (HLD) Interceptors	Project (Number/Name) MD40 / Program Wide Support
--	--	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: Program Wide Support	-	12.084	13.605	17.370	-	17.370	24.316	26.517	32.378	30.687	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Beginning in FY 2016, Program Wide Support (PWS) was proportionately allocated to Improved Homeland Defense (HLD) Interceptors. In FY 2017 and FY 2018, PWS reflects a proportional change as a result of increase in Improved Homeland Defense (HLD) Interceptors.

A. Mission Description and Budget Item Justification
PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA-wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	12.084	13.605	17.370
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: - Beginning in FY 2016, Program Wide Support was redistributed across RDT&E Program Elements with a proportional allocation to Homeland Defense (HLD) Interceptors			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	12.084	13.605	17.370

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / <i>Improved Homeland Defense (HLD) Interceptors</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / Improved Homeland Defense (HLD) Interceptors	Project (Number/Name) MD40 / Program Wide Support
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance (MIPR)	MIPR	Various : Multi: AL, VA	0.000	4.368		4.889	Mar 2017	4.503	Mar 2018	-		4.503	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, VA	0.000	0.000		0.262	Jul 2017	0.430	Jul 2018	-		0.430	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPRs)	MIPR	Various : Multi: AL, VA	0.000	0.000		0.000		4.677	May 2018	-		4.677	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	0.000	7.716		8.454	Jul 2017	7.760	Jul 2018	-		7.760	Continuing	Continuing	Continuing
Subtotal			0.000	12.084		13.605		17.370		-		17.370	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	12.084	13.605	17.370	-	17.370	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017											
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0604874C / <i>Improved Homeland Defense (HLD) Interceptors</i>				Project (Number/Name) MD40 / <i>Program Wide Support</i>									
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇								
MD40 Program-Wide Support				FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
				◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / <i>Improved Homeland Defense (HLD) Interceptors</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	107.043	20.980	63.444	36.239	-	36.239	68.865	15.667	49.706	51.451	Continuing	Continuing
MT07: <i>THAAD Test</i>	107.043	16.344	60.577	33.321	-	33.321	65.555	14.939	47.306	48.989	Continuing	Continuing
MD40: <i>Program Wide Support</i>	-	4.636	2.867	2.918	-	2.918	3.310	0.728	2.400	2.462	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

Ballistic Missile Defense Terminal Defense Segment Test provides the Terminal High Altitude Area Defense (THAAD) program's participation in Ballistic Missile Defense System (BMDS) Flight Tests and Ground Tests in accordance with the BMDS Integrated Master Test Plan (IMTP). THAAD Test coordinates with Operational Test Agencies, conducts flight test operations, performs post-flight test reporting, and performs data distribution and storage.

B. Program Change Summary (\$ in Millions)

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	26.225	63.444	69.959	-	69.959
Current President's Budget	20.980	63.444	36.239	-	36.239
Total Adjustments	-5.245	0.000	-33.720	-	-33.720
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-5.245	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	-33.720	-	-33.720

Change Summary Explanation

The decrease in FY2018 from PB17 to PB18 is a result of strategic test re-planning initiative for the Integrated Master Test Plan (IMTP).

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT07: <i>THAAD Test</i>	107.043	16.344	60.577	33.321	-	33.321	65.555	14.939	47.306	48.989	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

THAAD Test conducts BMDS Flight Tests and Ground Tests with other BMDS elements (such as Army Navy / Transportable Radar Surveillance (AN/TPY-2), BMDS Command, Control, Battle Management, and Communication (C2BMC), PATRIOT, and Aegis) in accordance with the BMDS IMTP. THAAD Test coordinates with Operational Test Agencies, conducts all pre and post flight test, ground test, and wargames and exercises requirements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Flight Test Execution	5.591	52.020	24.816
Articles:	-	-	-
Description: Performs all requirements to support flight test execution such as mission planning, pre-flight integration testing, conduct of readiness reviews, test asset transportation, flight test execution and data collection, post flight test reporting and data distribution.			
FY 2016 Accomplishments:			
<ul style="list-style-type: none"> - Completed FTO-02 E2a post-test reporting and data distribution. - Continued planning for FTT-18, a THAAD flight test against an Intermediate Range Ballistic Missile (IRBM). FTT-18 was planned for execution in 1Q FY 2016. However, due to range and resource availability, the mission was not executed. FTT-18 has now been rescheduled as a campaigned event with FTT-15 in 3Q FY 2017 at Kodiak Launch Complex in Alaska. - Initiated pre-mission planning for Flight Test THAAD-15 (FTT-15), to include long lead activities like range safety and weapon system performance analysis. FY 2016 funds are requested because long lead planning activities are required to begin approximately 12 months prior to a flight test event and FTT-15 is scheduled for 3Q FY 2017. 			
FY 2017 Plans:			
<ul style="list-style-type: none"> - The increase in flight test cost from FY 2016 to FY 2017 is due to the scheduled execution of one THAAD flight test in FY 2017, compared with no flight tests initially planned for FY 2016. In FY 2017 THAAD plans to execute Flight Test THAAD-15 (FTT-15). - Conduct flight test planning, range interface, coordination with Operational Test Agencies (OTAs) and execution of flight test operations for Flight Test THAAD-15 (FTT-15) to demonstrate THAAD's ability to intercept an Medium Range Ballistic Missile (MRBM) target using the THAAD radar, launcher, fire control and communications, Interceptor closed-loop operations, and 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>engagement functions. MDA is currently assessing various test range locations for opportunities to reduce test costs. Additionally, FTT-15 will be the first developmental test of THAAD against a complex target scene. The results will inform additional THAAD development against associated objects.</p> <ul style="list-style-type: none"> - Initiate pre-mission planning for Flight Test Operational-03 Event 2 (FTO-03 E2), to include long lead activities such as range safety and weapon system performance analysis. FY 2017 funds are requested because long lead planning activities are required to begin approximately 12 months prior to the FTO-03 E2 flight test event scheduled for fourth quarter FY 2018. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct description efforts to support the following test events in accordance with the IMTP: - Conduct Flight Test Tracking Event-35 (FTX-35) at White Sands Missile Range, which will prove THAAD software build 3.0 and test X86 AN/TPY-2 radar configuration with a THAAD Battery. - Conduct Flight Test Tracking Event-36, which will demonstrate interoperability and develop a coordinated firing solution between THAAD and PATRIOT. - Pre-mission Flight Test Operational-03 Event 2 (FTO-03 E2) (BMDS Operational Flight Test), which will further demonstrate, in an operational scenario, THAAD's ability to conduct coordinated engagements with Aegis and PATRIOT operating with (C2BMC) and forward-based AN/TPY-2 while engaging an Intermediate Range Ballistic Missile. - Flight Test THAAD-15/18 (FTT-15/18) post-test reporting and data distribution. 				
Title: Ground Test Execution		5.953	5.192	5.076
		Articles:	-	-
<p>Description: Ground Test Execution includes:</p> <ul style="list-style-type: none"> - THAAD participation in MDA Ground Test operational scenario events to ensure THAAD's ability to conduct coordinated engagements with Aegis and PATRIOT operating with C2BMC and AN/TPY-2, - Provides pre-mission planning, pre- and post-mission analyses, reporting, and execution to support BMDS Ground and Flight Test campaigns, and - Continues performance assessments to evaluate system performance and interoperability within the integrated BMDS. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Continued THAAD participation in MDA Ground Test operational scenario events GT-06 and GT-07 as described above. <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - Continue THAAD participation in MDA Ground Test operational scenario event GT-07 as described above. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Continue THAAD participation in MDA Ground Test operational scenario events GT-07 and GTI-ISR campaigns as described above. 				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
- Initiate THAAD participation in ground test system pre-mission analyses for FTO-03 E2.				
<p>Title: Resources</p> <p>Description: Resources include efforts to:</p> <ul style="list-style-type: none"> - Provide on-site range support for THAAD maintenance, repair, and pre-mission analysis to ensure THAAD test asset readiness, - Provide data management, facilities operations, and post-test reporting in support of BMDS tests to ensure data collection and readiness for mission execution, and - Continue Performance Assessments to evaluate system performance and interoperability within the integrated BMDS <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Supported cyber security initiatives for the BMDS Missile Defense Agency Windows 10 implementation. - See description. <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - See description. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - See description. 		<p>Articles:</p> <p>4.459</p> <p>-</p>	<p>2.920</p> <p>-</p>	<p>2.974</p> <p>-</p>
<p>Title: Wargames and Exercises</p> <p>Description: Wargames and Exercises support the Combatant Commands (CCMDs) with model and simulations and subject matter expertise during exercise events. Continue to assist in developing/refining Tactics, Techniques, and Procedures and Pre-Planned Responses to incorporate in future events. Demonstrate THAAD capability to the warfighter community in the Integrated and Missile Defense (IAMD) environment</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - See description. <p>FY 2017 Plans:</p> <ul style="list-style-type: none"> - See description. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - See description. 		<p>Articles:</p> <p>0.341</p> <p>-</p>	<p>0.445</p> <p>-</p>	<p>0.455</p> <p>-</p>
Accomplishments/Planned Programs Subtotals		16.344	60.577	33.321

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0208866C: MD07: <i>THAAD O&M</i>	58.308	72.099	78.761	-	78.761	87.478	92.082	91.832	93.716	Continuing	Continuing
• 0208866C: MD07: <i>THAAD Procurement</i>	447.971	369.608	451.592	-	451.592	440.883	405.015	420.829	429.463	978.463	3,943.824
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	197.617	209.072	230.162	-	230.162	194.328	253.778	264.377	267.254	Continuing	Continuing

Remarks

D. Acquisition Strategy

THAAD awards Indefinite Delivery Indefinite Quantity (IDIQ) Task Orders on the Advanced Capability Development (ACD) contract for the continuation of THAAD 2.0 development and test as described and approved in the MDA Integrated Master Test Plan. The discrete task orders allow management and tracking of IMTP-related work.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>
--	--	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Flight Test Execution - Execution, Support and Planning	MIPR	MDA / AMRDEC / KLC / Wake Island / RTS : AL / CO / AK / HI / Wake Island / Kwaj	58.806	5.491	Oct 2015	31.759	Oct 2016	15.099	Nov 2017	-		15.099	Continuing	Continuing	Continuing
Flight Test Execution - Planning, Analysis, and Execution	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	33.480	0.100	Oct 2015	20.261	Oct 2016	9.717	Nov 2017	-		9.717	Continuing	Continuing	Continuing
Ground Test Execution - BMDS Ground Test Support	MIPR	US Army AMRDEC : Huntsville, AL	4.917	5.953	Dec 2015	5.192	Oct 2016	5.076	Dec 2017	-		5.076	Continuing	Continuing	Continuing
Resources - Cyber Security - Simulation Center	MIPR	Space and Missile Systems Center (SMDC) : AL	0.000	0.100	Jun 2016	0.000		0.000		-		0.000	0	0.100	0
Resources - Cyber Security - Advanced Research Center Cyber Support	C/IDIQ	COLSA Corp : AL	0.000	0.552	Jun 2016	0.000		0.000		-		0.000	0	0.552	0
Resources - Cyber Security - NSITE/GT Comms/Test Control System	MIPR	Aviation & Missile Research & Development : AL	0.000	0.913	Jun 2016	0.000		0.000		-		0.000	0	0.913	0
Resources - Cyber Security - TCS/ULAN/CLAN Pacific Colector	C/IDIQ	Northrop Grumman Space & Mission System : CO	0.000	0.559	Jun 2016	0.000		0.000		-		0.000	0	0.559	0
Resources - Cyber Win10 Implementation - TTS	C/IDIQ	Analytical Services, Inc. : AL	0.000	0.231	May 2016	0.000		0.000		-		0.000	0	0.231	0
Resources - Cyber Win10 Implementation - XTR/PCRSS/ELTS/Flight Test Comms	MIPR	NSWC : Pt Mugu / NAWC WD / WSMR	0.000	0.776	Jun 2016	0.000		0.000		-		0.000	0	0.776	0
Resources - MDA Test IT Program Support	C/CPAF	Northrup Grumman : AL, AK, CA, CO, HI, NM, VA	2.830	0.000		0.000		0.000		-		0.000	0	2.830	0

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency											Date: May 2017				
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>					Project (Number/Name) MT07 / <i>THAAD Test</i>				

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Resources - Test and Range Infrastructure	MIPR	US Army AMRDEC / White Sands Missile Range / Lincoln Labs : Huntsville, AL / White Sands, NM / MA	6.633	1.328	Dec 2015	2.920	Oct 2016	2.974	Dec 2017	-		2.974	Continuing	Continuing	Continuing
Wargames and Exercises - Wargames and Exercises	MIPR	MDA / Space and Missile Defense Command : Huntsville, AL	0.377	0.341	Oct 2015	0.445	Oct 2016	0.455	Nov 2017	-		0.455	Continuing	Continuing	Continuing
Subtotal			107.043	16.344		60.577		33.321		-		33.321	-	-	-

Remarks
 - Increases in R-3 Cost Category Items related to Flight Test Execution from FY 2016 to FY 2017 are due to no flight test being executed in FY 2016. In FY 2017 THAAD plans to execute Flight Test THAAD-15 (FTT-15) and initiate test planning activities for Flight Test Operational-03 Event 2 (FTO-03 E2).

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	107.043	16.344	60.577	33.321	-	33.321	-	-	-

Remarks
 N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>
--	--	--

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		Planned Activity ◇		Planned Activity ◇	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Complete Activity ◆		Planned Activity ◇		Planned Activity ◇	
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
GTI-06 Part 2 (BMDS Ground Test)						◆								
GTI-ISR (16) (BMDS Ground Test)						◆								
GTD-06 Part 2 (BMDS Ground Test)							◆							
FTT-18 (TH, Intercept Flight Test)														
FTT-15 (TH, Intercept Flight Test)							△							
GTI-07a (BMDS Ground Test)							◇	◇						
GTD-07a (BMDS Ground Test)								◇						
FTX-35 (TH, Target Only Flight Test)														
FTX-36 (TH, Patriot Target Only Flight Test)								△						
GTI-07b (E/C) (BMDS Ground Test)								◇	◇					
GTD-07b (E/C) (BMDS Ground Test)									◇	◇				
GTI-07b (N/P) (BMDS Ground Test)										◇				
GTI-ISR (18) (BMDS Ground Test)										△				
FT0-03 E2 (OTA, Intercept Flight Test)											△			
GTD-07b (N/P) (BMDS Ground Test)										◇	◇			
GTI-08 (E/C) (BMDS Ground Test)										◇	◇			
GTI-08 (N/P)(BMDS Ground Test)												◇	◇	
FTT-19 (TH, Intercept Flight Test)													△	
GTD-08 (E/C) (BMDS Ground Test)												◇	◇	
GTD-08 (N/P) (BMDS Ground Test)														◇
GT-21 Sprint 1 (BMDS Ground Test)														◇
GT-21 Sprint 2 (BMDS Ground Test)														◇
GT-21 Sprint 3 (BMDS Ground Test)														◇
GT-21 Sprint 4 (BMDS Ground Test)														◇

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>
--	--	--

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
GTI-ISR (21) (BMDS Ground Test)												◇		
FTT-21 (TH, Intercept Flight Test)													△	
GT-21 Sprint 5 (BMDS Ground Test)												◇		
GT-21 Sprint 6 (BMDS Ground Test)												◇		
GT-22 Sprint 1 (BMDS Ground Test)													◇	
GT-22 Sprint 2 (BMDS Ground Test)														◇
GT-22 Sprint 3 (BMDS Ground Test)														◇
FTX-28 E1 (TH, Target Only Flight Test)														△
FTX-28 E2 (TH, Target Only Flight Test)														△
FTX-28 E3 (TH, Target Only Flight Test)														△
GT-22 Sprint 4 (BMDS Ground Test)														◇
GTD-22 (E/C) (BMDS Ground Test)														◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GTI-06 Part 2 (BMDS Ground Test)	3	2016	3	2016
GTI-ISR (16) (BMDS Ground Test)	3	2016	3	2016
GTD-06 Part 2 (BMDS Ground Test)	4	2016	4	2016
FTT-18 (TH, Intercept Flight Test)	3	2017	3	2017
FTT-15 (TH, Intercept Flight Test)	3	2017	3	2017
GTI-07a (BMDS Ground Test)	3	2017	4	2017
GTD-07a (BMDS Ground Test)	4	2017	4	2017
FTX-35 (TH, Target Only Flight Test)	2	2018	2	2018
FTX-36 (TH, Patriot Target Only Flight Test)	2	2018	2	2018
GTI-07b (E/C) (BMDS Ground Test)	2	2018	3	2018
GTD-07b (E/C) (BMDS Ground Test)	4	2018	1	2019
GTI-07b (N/P) (BMDS Ground Test)	1	2019	1	2019
GTI-ISR (18) (BMDS Ground Test)	1	2019	1	2019
FT0-03 E2 (OTA, Intercept Flight Test)	2	2019	2	2019
GTD-07b (N/P) (BMDS Ground Test)	3	2019	4	2019
GTI-08 (E/C) (BMDS Ground Test)	4	2019	1	2020
GTI-08 (N/P)(BMDS Ground Test)	2	2020	3	2020
FTT-19 (TH, Intercept Flight Test)	3	2020	3	2020
GTD-08 (E/C) (BMDS Ground Test)	3	2020	4	2020
GTD-08 (N/P) (BMDS Ground Test)	1	2021	1	2021
GT-21 Sprint 1 (BMDS Ground Test)	1	2021	1	2021
GT-21 Sprint 2 (BMDS Ground Test)	2	2021	2	2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MT07 / <i>THAAD Test</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
GT-21 Sprint 3 (BMDS Ground Test)	2	2021	3	2021
GT-21 Sprint 4 (BMDS Ground Test)	3	2021	3	2021
GTI-ISR (21) (BMDS Ground Test)	3	2021	3	2021
FTT-21 (TH, Intercept Flight Test)	4	2021	4	2021
GT-21 Sprint 5 (BMDS Ground Test)	4	2021	4	2021
GT-21 Sprint 6 (BMDS Ground Test)	4	2021	4	2021
GT-22 Sprint 1 (BMDS Ground Test)	1	2022	1	2022
GT-22 Sprint 2 (BMDS Ground Test)	2	2022	2	2022
GT-22 Sprint 3 (BMDS Ground Test)	2	2022	2	2022
FTX-28 E1 (TH, Target Only Flight Test)	3	2022	3	2022
FTX-28 E2 (TH, Target Only Flight Test)	3	2022	3	2022
FTX-28 E3 (TH, Target Only Flight Test)	3	2022	3	2022
GT-22 Sprint 4 (BMDS Ground Test)	3	2022	3	2022
GTD-22 (E/C) (BMDS Ground Test)	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program Wide Support</i>	-	4.636	2.867	2.918	-	2.918	3.310	0.728	2.400	2.462	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Beginning in FY 2016, Program Wide Support (PWS) was proportionately allocated to the Ballistic Missile Defense Terminal Defense Segment Test. In FY 2017 and FY 2018, PWS reflects a proportional change as a result an increase in Ballistic Missile Defense Terminal Defense Segment Test.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	4.636	2.867	2.918
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	4.636	2.867	2.918

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, VA, Aust, Japan	0.000	0.000		0.057	Jul 2017	0.058	Jul 2018	-		0.058	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	Various : VA	0.000	4.174		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support International and Materiel and Readiness	MIPR	Various : Multi: AL, VA, Aust, Japan	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	0.000	0.462		2.810	Aug 2017	2.860	Aug 2018	-		2.860	Continuing	Continuing	Continuing
Subtotal			0.000	4.636		2.867		2.918		-		2.918	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.636	2.867	2.918	-	2.918	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	88.041	78.468	95.012	134.468	-	134.468	73.059	82.570	113.856	97.660	Continuing	Continuing
MT09: <i>AEGIS BMD Test</i>	88.041	76.043	90.953	128.776	-	128.776	69.548	78.734	108.359	92.987	Continuing	Continuing
MD40: <i>Program Wide Support</i>	-	2.425	4.059	5.692	-	5.692	3.511	3.836	5.497	4.673	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

FY 2018 increase provides additional flight tests consistent with the Integrated Master Test Plan (IMTP) and increased Aegis BMD Hardware-In-The-Loop (HWIL) lab participation to reduce risk during integration for runs for the record.

A. Mission Description and Budget Item Justification

The Aegis Ballistic Missile Defense (BMD) mission is to deliver an enduring, operationally effective and supportable BMD capability to defend the nation, deployed forces, friends and allies, and to increase this capability by delivering evolutionary improvements as part of the Ballistic Missile Defense System (BMDS) upgrades. The Aegis BMD element of the BMDS capitalizes upon and evolves from the existing United States Navy Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures. Aegis BMD provides a forward-deployable, mobile capability to detect and track Ballistic Missiles of all ranges, and the ability to destroy Short-Range Ballistic Missiles (SRBMs), Medium-Range Ballistic Missiles (MRBMs), and Intermediate-Range Ballistic Missiles (IRBMs) in the midcourse phase of flight and shorter range missiles in the terminal phase of flight. Aegis BMD also provides a Long Range Surveillance and Track (LRS&T) capability to the BMDS. Upgrades to both the Aegis BMD Weapon System and the SM-3 configuration enable Aegis BMD to provide effective, supportable defensive capability against longer range, more sophisticated threats and an enduring Aegis Ashore defensive capability.

Proving Missile Defense:

- Working with the Services' Agency level BMDS Operational Test Agency (OTA) Team, with the support of the Director of Operational Test and Evaluation (DOT&E), MDA has developed a test program to improve confidence in missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable.
- As part of the Agency's rigorous test program, System Pre-Flight predictions provide confidence in test execution by predicting element performance and exercising element interfaces. System Post-Flight Reconstruction replicates the BMDS configuration, actual environmental conditions, and target dynamics observed in flight to anchor modeling and simulation (M&S) results.
- The IMTP is event-oriented and extends until the collection of all identified data is completed to ensure adequate test investments.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	78.468	95.012	127.720	-	127.720
Current President's Budget	78.468	95.012	134.468	-	134.468
Total Adjustments	0.000	0.000	6.748	-	6.748
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	6.748	-	6.748

Change Summary Explanation

The increase in FY2018 from PB17 to PB18 is in support of flight test schedule in IMTP.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>				Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT09: <i>AEGIS BMD Test</i>	88.041	76.043	90.953	128.776	-	128.776	69.548	78.734	108.359	92.987	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Budget Accomplishments are structured for direct traceability to the Integrated Master Test Plan (IMTP) and efficient management of testing execution efforts. Test funding falls under the following accomplishments: Aegis BMD Flight Test Execution, Aegis BMD Ground Test Execution, Aegis BMD Test Resources and Engineering & Analysis.

A. Mission Description and Budget Item Justification

The FY 2018 Aegis BMD Test Program will concentrate on critical IMTP flight tests that support the Navy and European Phased Adaptive Approach (EPAA). Aegis BMD will concentrate on Aegis BL 9.C2 (BMD 5.x) and Standard Missile SM-3 Block IIA testing in FY 2018.

Proving Missile Defense:

- Working with the Navy Integrated Warfare System (IWS) Services' Operational Test Agencies (OTA), with the support of the Director of Operational Test and Evaluation (DOT&E), MDA has developed a test program to improve missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable
- As part of MDA's rigorous test program, System Pre-Flight predictions provide confidence in test execution by predicting element performance and exercising element interfaces. System Post-Flight Reconstruction replicates the Ballistic Missile Defense System configuration and actual environmental conditions and target dynamics observed in flight to anchor Modeling and Simulation (M&S) results
- The IMTP is event-oriented and extends until the collection of all identified data is completed to ensure adequate test investments

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Aegis BMD Flight Test Execution	27.320	38.962	59.140
Articles:	-	-	-
Description: Aegis BMD Flight Test Program performs comprehensive testing of Aegis BMD components and their interoperability with the BMDS using accredited Modeling & Simulation (M&S) that provides the evidence required for the MDA and Combatant Commanders to transition the capability to the Operational Capacity Baseline. All flight testing is reflected in the R4 and IMTP.			
Recurring Accomplishments include:			
-Prepare for and conduct BMDS Flight Test events as reflected in the IMTP and the Exhibit R-4 schedule.			
-Collect Aegis BMD data for Modeling and Simulation anchoring used in comprehensive flight testing.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017		FY 2018
---	----------------	----------------	--	----------------

<p>-Conduct Aegis BMD specific analysis during pre- and post-mission analysis phases to confirm pre-mission predictions of mission success and validate post-test results.</p> <p>-Conduct test milestone reviews to ensure readiness for test execution and accomplishment of test objectives.</p> <p>Below are items unique to an FY:</p> <p>FY 2016 Accomplishments: Support of flight tests scheduled in the IMTP to include Standard Missile 3 (SM-3) Control Test Vehicle (CTV) 01 and CTV 02 - Conducted activities listed in Description section above).</p> <p>FY 2017 Plans: Increase from FY 2016 to FY 2017 is in support of flight tests scheduled in the IMTP to include FTM-24 (BMD 5.0 CU DT/OT) and FTM-29(BMD 5.1 DT/OT). - Conduct activities listed in Description section (above).</p> <p>FY 2018 Plans: Increase from FY 2017 to FY 2018 is in support of flight tests scheduled in the IMTP to include FTO-3 Event 1 (BMD 5.1/SM-3Blk IIA) and FEV-01 (FTM-DST 1) (AEGIS 5.0, Intercept Flight Test) These operational tests support the Navy and the European Phased Adaptive Approach (EPAA) for the defense of Europe. - Conduct activities listed in Description section (above).</p>				
---	--	--	--	--

Title: Aegis BMD Ground Test Execution	6.116	11.594		29.680
Articles:	-	-		-

Description: Aegis BMD Ground Test Program performs comprehensive testing of Aegis BMD Components and their interoperability with the BMDS using accredited M&S that provides the evidence required for the MDA and Combatant Commanders to transition the capability to the Operational Capacity Baseline. More specifically, ground testing is used to collect data for Aegis BMD characterization and assessment, flight test risk reduction, and exploration of scenarios where flight testing is either impracticable or impossible.

Recurring Accomplishments include:

- Participate in BMD System Ground Tests to include pre-mission analysis, mission execution, and post-mission analysis.
- Conduct planning to ensure BMDS Test Site (BTS) capabilities support Aegis BMD testing, exercises, flight tests, and demonstration requirements. This includes upgrades to the ground testing labs to ensure compliance with operational and test baselines.
- Continue testing of Navy C4I systems and Aegis BMD baselines to ensure BMDS interoperability.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<p>-Continue to participate in System Level Ground Testing as an element of the layered BMDS to collect data for Aegis BMD characterization and assessment and exploration of scenarios where flight testing is either impracticable or impossible. -Continue operation support of Hardware-In-the-Loop (HWIL) Modeling & Simulation for Element ground testing. -Prepare and conduct a Hardware Ground Test of cooled gas Attitude Control System (ACS).</p> <p>FY 2016 Accomplishments: New accomplishment developed to align within new MT09 restructure for traceability to the IMTP: - Funding previously captured in Project MT09, BMDS Level Testing and Project MT09, Aegis Ballistic Missile Defense (BMD) Testing. - Conducted activities listed in Description section (above).</p> <p>FY 2017 Plans: The increase in funding from FY 2016 to FY 2017 is due to more complex ground tests which lead up to the European Phase Adaptive Approach (EPAA) Phase III declaration as reflected in the R-4 and the IMTP. - Conduct activities listed in Description section (above).</p> <p>FY 2018 Plans: The increase in funding from FY 2017 to FY 2018 is due to increased Aegis BMD HWIL lab participation in early integration to provide risk reduction for Ground Test runs for the record and implementation of Continuous Integration and Continuous Agile Testing Concept of Operations (CONOPS) pathfinders. - Conduct activities listed in Description section (above).</p>			
---	--	--	--

Title: Aegis BMD Test Resources	30.247	28.491	26.931
Articles:	-	-	-

Description: This effort provides resources to conduct ground and flight testing to improve confidence in missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable.

Recurring Accomplishments include:

- Provide Core Test and Evaluation support for Aegis BMD test and evaluation missions and laboratories, field activities, range support activities, analysis activities, and shipboard and land-based test site test teams.
- Provide Test & Evaluation (T&E) infrastructure support for Aegis BMD Test Missions as reflected in the IMTP to collect truth data for post-event analysis.
- Conduct core Element M&S validation and accreditation activities.
- Exercise tactical communications during testing to ensure interoperability with the BMDS and Combatant Command (CCMD) systems.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

- Continue core test planning for FY 2017 and FY 2018 Aegis BMD test missions to include assessment of target requirements, development of M&S, and preparation of the range to ensure all missions are executable and apply to the technical program objectives.

- Develop and execute risk-reduction activities to minimize or mitigate shipboard and missile test and programs risks.

- Develop and execute data collection plans and supporting instrumentation requirements.

FY 2016 Accomplishments:

- Conducted activities listed in Description section (above).

- Began test planning for FY 2017 Aegis BMD flight test mission to include preparation of targets, development of M&S, and preparation of the range to ensure all missions are executable and apply to the technical program objectives.

- Conducted post-test analysis for all flight testing conducted in FY 2015 for Aegis BMD missions to validate results

- Prepared for and conducted BMDS flight events as reflected in the IMTP and the Exhibit R-4 schedule in accordance with Congressional and Presidential guidance.

- Participated in BMDS Special Technology experiments and demonstrations to expand the capabilities of the Aegis BMD to use a diverse set of inputs.

FY 2017 Plans:

The decrease in funding from FY 2016 to FY 2017 is due to realignment and consolidation of core test functions.

- Conduct activities listed in Description section (above).

FY 2018 Plans:

The decrease in funding from FY 2017 to FY 2018 is due to realignment and consolidation of core test functions.

- Conduct activities listed in Description section (above).

Title: Engineering & Analysis	12.360	11.906	13.025
Articles:	-	-	-

Description: The Engineering and Analysis effort provides essential BMDS ground and flight test event planning, execution, and evaluation activities for each test event:

Recurring Accomplishments:

- Designing test architecture, defining test objectives and evaluation criteria, defining target requirements, and generating ground and flight test scenarios appropriate to the data collection requirements to assess BMDS performance and anchor Models and Simulations.

- Producing the threat data for BMDS ground and flight tests.

- Coordinating with BMDS Operational Test Agency (OTA) to address test issues, disposition them, coordinate them, with the OTA and recommend action plans to achieve closure.

- Delivering hardware-in-the-loop (HWIL) M&S integration test cases.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

<ul style="list-style-type: none"> - Conducting M&S HWIL Integration Benchmark and integrating the BMDS HWIL M&S framework with MDA and non-MDA Elements into the test event BMDS architecture. - Integrating, testing, functionally qualifying, and delivering end-to-end BMDS simulations supporting ground test missions. - Analyzing System-level interoperability. - Conducting modeling and technical analysis for Combatant Command wargames and exercises. - Utilizing M&S for pre-test assessment and post-test review, as well as M&S updates. - Providing test configuration management; risk assessments; and anomaly/deficiency review, assessment and closure. - Analyzing test results to identify verification and validation data collection shortfalls and reassigning objectives to future test events as required. - Documenting BMDS test observations for system-level test anomalies and coordinating the resulting BMDS Discrepancy Reports within the Failure Reporting, Analysis, and Corrective Action System (FRACAS) - Providing the Quick Look Brief, Mission Data Review (MDR), and Executive MDR. <p>IMTP and infrastructure tasks include:</p> <ul style="list-style-type: none"> - Providing long-range BMDS IMTP planning and integration strategies related to overarching BMDS analysis product integration. - Upgrading test analysis tools in concert with the BMDS evolution (e.g., Modular Analysis and Reporting Suite (MARS)) to enhance analysis capability and efficiency. - Populating the MARS database with data from the most recently completed tests to support as-built analysis and capability assessments. - Providing engineering analysis process software to include System Coordination and Observation Reporting Environment (SCORE), Software Change Analysis Review Environment (SCARE), File Manager (FileMan), and ManPower Loading (MPL). - Incrementally improving and providing infrastructure, software, and MDA/IA compliance for the RApid Scenario Prototyping (RaSP) capability. <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Completed the activities listed in the Description section above. <p>FY 2017 Plans:</p> <p>FY 2017 increase keeps pace with projected FY 2017-FY 2021 IMTP events.</p> <ul style="list-style-type: none"> - Complete the activities listed in the Description section above. - Validate test event data collection and conduct post-test analyses supporting delivery of Near-term Discrimination Improvements and Enhanced Homeland Defense capabilities. <p>FY 2018 Plans:</p> <p>FY 2018 increase keeps pace with projected FY 2018-FY 2022 IMTP events.</p> <ul style="list-style-type: none"> - Complete the activities listed in the Description section above. 			
---	--	--	--

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Validate test event data collection and conduct post-test analyses supporting the EPAA Phase 3 Technical Capability Declaration.			
Accomplishments/Planned Programs Subtotals	76.043	90.953	128.776

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0604880C: <i>Land Based SM-3 (LBSM3)</i>	29.288	43.293	30.486	-	30.486	31.816	33.024	31.707	30.924	Continuing	Continuing
• 0604881C: <i>AEGIS SM-3 Block IIA Co-Development</i>	165.456	106.038	9.739	-	9.739	0.000	0.000	0.000	0.000	0	281.233

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / Aegis BMD Test	Project (Number/Name) MT09 / AEGIS BMD Test
--	--	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution	MIPR	Various - DT : HI,VA,CA,MA,NC	0.000	0.000		0.000		11.825	Dec 2017	-		11.825	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09 - CPF	MIPR	COMPACTFLT : HI	0.000	0.000		0.000		1.337	Dec 2017	-		1.337	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09 - Corvid	SS/CPFF	Corvid : NC	0.000	0.000		0.000		1.322	Dec 2017	-		1.322	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09 -JHU/APL	SS/CPFF	JHU/APL : Columbia MD	2.196	2.998		5.062	Dec 2016	9.000	Dec 2017	-		9.000	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09- Corona	MIPR	NSWC Corona : CA	2.215	0.950		1.588	Nov 2016	3.200	Dec 2017	-		3.200	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-DMEA	MIPR	DMEA : McClellan, CA	0.000	0.000		0.819	Oct 2016	0.300		-		0.300	0	1.119	0
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-L3 Communications	C/CPFF	L3 Communications : Waco, TX	0.000	0.000		3.276	Apr 2017	2.100	Dec 2017	-		2.100	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NAWC/AD	MIPR	NAWC/AD-PHX Air : Pax River, MD	1.058	1.000		2.085	Apr 2017	1.200	Dec 2017	-		1.200	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NAWC/PM	MIPR	NAWC/PM : Pt. Mugu, CA	0.350	1.800		7.197	Oct 2016	3.505	Dec 2017	-		3.505	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / Aegis BMD Test	Project (Number/Name) MT09 / AEGIS BMD Test
--	--	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NRL	MIPR	Naval Research Lab : Washington, DC	0.000	0.000		0.794	Apr 2017	0.450	Dec 2017	-		0.450	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NSWC DD	MIPR	NSWC Dahlgren : Dahlgren, VA	0.400	1.131		1.291	Dec 2016	1.360	Dec 2017	-		1.360	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NSWC CR	MIPR	NSWC Carderock : Potomac, MD	0.000	0.000		0.893	Jan 2017	0.800	Dec 2017	-		0.800	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-PHD	MIPR	NSWC PHD : Pt. Hueneme, CA	3.083	1.852		3.574	Oct 2016	5.420	Dec 2017	-		5.420	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-PMRF	MIPR	PMRF Barking Sands : Kauai, HI	0.990	4.025		6.155	Oct 2016	8.780	Dec 2017	-		8.780	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-SSCPAC	MIPR	SPAWAR : San Diego, CA	1.277	0.000		1.837	Nov 2016	1.250	Dec 2017	-		1.250	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-Variou	MIPR	Various : HI, VA, CA, MA, NC, NJ, AZ	11.273	6.024		3.572	Oct 2016	6.736	Dec 2017	-		6.736	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-Xontech	C/CPFF	Xontech : Colorado Spring, CO	0.000	0.000		0.819	Mar 2017	0.555	Dec 2017	-		0.555	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Flight Test Execution	SS/CPFF	Lockheed Martin : NJ	0.000	1.140		0.000		0.000		-		0.000	0	1.140	0

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / Aegis BMD Test	Project (Number/Name) MT09 / AEGIS BMD Test
--	--	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aegis BMD Flight Test Execution - Flight Test Execution - RMS	SS/CPFF	Raytheon : AZ	0.000	6.400		0.000		0.000		-		0.000	0	6.400	0
Aegis BMD Ground Test Execution - ATK	MIPR	ATK : Elkton MD	0.000	0.000		2.005		0.000		-		0.000	0	2.005	0
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - CORONA	MIPR	NSWC Corona : CA	0.800	0.650	Nov 2015	0.750	Nov 2016	1.500	Nov 2017	-		1.500	Continuing	Continuing	Continuing
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - JHU/APL MDA	SS/CPFF	JHU/APL : MDA	0.500	0.000		0.000		3.000	Nov 2017	-		3.000	Continuing	Continuing	Continuing
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - LM	MIPR	Lockheed Martin : Moorestown, NJ	7.624	2.697	Nov 2015	3.652	Oct 2016	8.802	Nov 2017	-		8.802	Continuing	Continuing	Continuing
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - MDA	MIPR	MDA : Arlington, VA	0.000	0.000		0.780	Dec 2016	0.000		-		0.000	0	0.780	0
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - PHD	MIPR	NSWC PHD : Pt. Hueneme, CA	0.400	0.603	Nov 2015	0.750	Nov 2016	1.500	Nov 2017	-		1.500	Continuing	Continuing	Continuing
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - SSCPAC	MIPR	SPAWAR : San Diego, CA	5.460	2.166	Nov 2015	3.657	Oct 2016	14.878	Nov 2017	-		14.878	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - APL	SS/CPFF	JHU/APL : Columbia MD	14.567	10.917	Nov 2015	9.091	Oct 2016	10.031	Nov 2017	-		10.031	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD	MIPR	Aegis BMD : VA	0.745	0.000		1.200	Dec 2016	0.000		-		0.000	0	1.945	0

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / Aegis BMD Test	Project (Number/Name) MT09 / AEGIS BMD Test
--	--	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Resources - MT09 - Aegis															
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - CORONA	MIPR	NSWC Corona : CA	2.771	4.675	Nov 2015	2.700	Oct 2016	4.000	Nov 2017	-		4.000	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - NAVSEA	MIPR	NAVSEA : VA	0.000	0.000		0.200	Jan 2017	0.000		-		0.000	0	0.200	0
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - NAWC/PM	MIPR	NAWC/PM : Pt. Mugu, CA	0.550	0.650	Nov 2015	0.700	Oct 2016	0.830	Nov 2017	-		0.830	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - NSWCDD	MIPR	NSWC Dahlgren : Dahlgren, VA	5.957	3.300	Nov 2015	3.500	Nov 2016	3.500	Nov 2017	-		3.500	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - PHD	MIPR	NSWC PHD : Pt. Hueneme, CA	4.000	5.050	Nov 2015	5.500	Oct 2016	4.000	Nov 2017	-		4.000	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - PMRF	MIPR	PMRF Barking Sands : Kauai, HI	0.430	0.700	Nov 2015	1.000	Jan 2017	1.370	Nov 2017	-		1.370	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - SSCPAC	MIPR	SPAWAR : San Diego, CA	2.265	1.700	Nov 2015	1.600	Oct 2016	1.800	Nov 2017	-		1.800	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - Various	MIPR	Various : HI, VA, CA, MA, MD	6.668	3.255	Nov 2015	3.000	Apr 2017	1.400	Nov 2017	-		1.400	Continuing	Continuing	Continuing
Engineering & Analysis - Engineering & Analysis -	C/CPAF	Northrop Grumman : AL, CO	1.526	1.561	Nov 2015	1.851	Nov 2016	2.160	Nov 2017	-		2.160	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / Aegis BMD Test	Project (Number/Name) MT09 / AEGIS BMD Test
--	--	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering & Analysis - Engineering Support															
Engineering & Analysis - Engineering & Analysis - Engineering & Analysis - FFRDC/UARC	MIPR	Various : AL, CO, VA	6.257	4.266	Nov 2015	3.182	Nov 2016	2.305	Nov 2017	-		2.305	Continuing	Continuing	Continuing
Engineering & Analysis - Engineering & Analysis - Engineering & Analysis - Industry	C/CPAF	Boeing : AL	1.079	0.702	Nov 2015	0.716	Nov 2016	0.000		-		0.000	0	2.497	0
Engineering & Analysis - Engineering & Analysis - Engineering & Analysis - OGA	MIPR	AMRDEC : AL	3.600	5.831	Nov 2015	6.157	Nov 2016	6.760	Nov 2017	-		6.760	Continuing	Continuing	Continuing
Engineering & Analysis - Engineering & Analysis - NME	C/CPAF	Northrop Grumman-JRDC : CO, AL	0.000	0.000		0.000		0.500	Nov 2017	-		0.500	Continuing	Continuing	Continuing
Engineering & Analysis - Engineering & Analysis - NME Support	MIPR	SPAWAR : CA	0.000	0.000		0.000		1.300	Nov 2017	-		1.300	Continuing	Continuing	Continuing
Subtotal			88.041	76.043		90.953		128.776		-		128.776	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	88.041	76.043	90.953	128.776	-	128.776	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>
--	---	--

	Significant Event Complete ▲ Significant Event Planned △	Milestone Decision Complete ★ Milestone Decision Planned ☆	Element Test Complete ◆ Element Test Planned ◇	System Level Test Complete ● System Level Test Planned ○		Complete Activity ◆ Planned Activity ◇														
								FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022						
AA CTV-02 (FTO-02 E1a CTV) AEGIS AA, Intercept Only Flight Test	▲																			
ASD-15 (Intercept Flight Test)	◆																			
SCD CTV-02 (AEGIS SCD, Intercept Only Flight Test)	▲																			
GM CTV-02 Plus (GM, Intercept Flight Test)		▲																		
SM CTV-01 (AEGIS 3.6.1, Intercept Only Flight Test)		▲																		
GTI-ISR (16) (BMDS Ground Test)			◆																	
GTI-06 Part 2 (BMDS Ground Test)			◆																	
SM CTV-02 (AEGIS 3.6.1, Intercept Only Flight Test)		▲																		
SM CTV-01a (AEGIS 3.6.1, Intercept Only Flight Test)		▲																		
GTD-06 Part 2 (BMDS Ground Test)			◆																	
FTM-27 (AEGIS SBT, Intercept Flight Test)						△														
Warfighter TP 06 (BMDS Ground Test)						◇														
SFTM-01 (AEGIS 5.1, Intercept Flight Test)						△														
GTI-07a (BMDS Ground Test)							◇													
SFTM-02 (AEGIS 5.1, Intercept Flight Test)							△													
FTP-13 (P8-0T4) (LTPO, Intercept Flight Test)							△													
GTD-07a (BMDS Ground Test)								◇												
FTX-24 (AEGIS SBT, Target Only Flight Test)									△											
FTM-27 (Aegis, Intercept Flight Test)										△										
FTM-26 (Aegis Intercept Flight Test)											△									
SM CTV-03 (Aegis 3.6.1, Intercept Only Flight Test)												△								
FEV-01 (FTM-DST 1) (AEGIS 5.0, Intercept Flight Test)													△							
FTM-29 (AEGIS 5.1, Intercept Flight Test)														△						
Warfighter TP 07a (BMDS Ground Test)																			◇	

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>
--	---	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2016			FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022		
GTI-07b (E/C) (BMDS Ground Test)								◇													
FTM-33 (AEGIS SBT, Intercept Flight Test)								△													
GTI-07b (N/P) (BMDS Ground Test)								◇	◇												
GTD-07b Part 1 (E/C) (BMDS Ground Test)								◇													
FT0-03 E1 (OTA, Intercept Flight Test)								△													
JFTM-5 E1 (AEGIS 5.1, Intercept Flight Test)								△													
JFTM-5 E2 (AEGIS 5.1, Intercept Flight Test)								△													
GTI-ISR (18) (BMDS Ground Test)									△												
FTM-31 (AEGIS SBT, Intercept Flight Test)									△												
GTD-07b Part 2 (N/P) (BMDS Ground Test)										◇											
FT0-03 E2 (OTA, Intercept Flight Test)									△												
FTM-32 (AEGIS SBT, Intercept Flight Test)										△											
FTX-23 (AEGIS 5.1, Target Only Flight Test)											△										
FEV-02 (FTM-DST 2) (AEGIS 5.0, Intercept Flight Test)											△										
GTI-08 (E/C) (BMDS Ground Test)											◇	◇									
GTD-08 Part 1 (E/C) (BMDS Ground Test)											◇	◇									
Warfighter TP 07b (BMDS Ground Test)												◇									
GTI-08 (N/P) (BMDS Ground Test)													◇								
JFTM-7 E1 (AEGIS 5.1, Intercept Flight Test)														△							
JFTM-7 E2 (AEGIS 5.1, Intercept Flight Test)															△						
FTM-30 (AEGIS 5.1, Intercept Flight Test)																△					
FTM-24 (AEGIS 5.0 Intercept Flight Test)																△					
GTD-08 Part 2 (N/P) (BMDS Ground Test)																	◇				
GT-21 Sprint 1 (BMDS Ground Test)																		◇			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AA CTV-02 (FTO-02 E1a CTV) AEGIS AA, Intercept Only Flight Test	1	2016	1	2016
ASD-15 (Intercept Flight Test)	1	2016	1	2016
SCD CTV-02 (AEGIS SCD, Intercept Only Flight Test)	1	2016	1	2016
GM CTV-02 Plus (GM, Intercept Flight Test)	2	2016	2	2016
SM CTV-01 (AEGIS 3.6.1, Intercept Only Flight Test)	2	2016	2	2016
GTI-ISR (16) (BMDS Ground Test)	3	2016	3	2016
GTI-06 Part 2 (BMDS Ground Test)	3	2016	3	2016
SM CTV-02 (AEGIS 3.6.1, Intercept Only Flight Test)	3	2016	3	2016
SM CTV-01a (AEGIS 3.6.1, Intercept Only Flight Test)	3	2016	3	2016
GTD-06 Part 2 (BMDS Ground Test)	4	2016	4	2016
FTM-27 (AEGIS SBT, Intercept Flight Test)	1	2017	1	2017
Warfighter TP 06 (BMDS Ground Test)	2	2017	2	2017
SFTM-01 (AEGIS 5.1, Intercept Flight Test)	2	2017	2	2017
GTI-07a (BMDS Ground Test)	3	2017	3	2017
SFTM-02 (AEGIS 5.1, Intercept Flight Test)	3	2017	3	2017
FTP-13 (P8-0T4) (LTPO, Intercept Flight Test)	3	2017	3	2017
GTD-07a (BMDS Ground Test)	4	2017	4	2017
FTX-24 (AEGIS SBT, Target Only Flight Test)	4	2017	4	2017
FTM-27 (Aegis, Intercept Flight Test)	4	2017	4	2017
FTM-26 (Aegis Intercept Flight Test)	4	2017	4	2017
SM CTV-03 (Aegis 3.6.1, Intercept Only Flight Test)	4	2017	4	2017
FEV-01 (FTM-DST 1) (AEGIS 5.0, Intercept Flight Test)	4	2017	4	2017
FTM-29 (AEGIS 5.1, Intercept Flight Test)	1	2018	1	2018

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>
--	---	--

Events	Start		End	
	Quarter	Year	Quarter	Year
Warfighter TP 07a (BMDS Ground Test)	2	2018	2	2018
GTI-07b (E/C) (BMDS Ground Test)	2	2018	2	2018
FTM-33 (AEGIS SBT, Intercept Flight Test)	3	2018	3	2018
GTI-07b (N/P) (BMDS Ground Test)	3	2018	4	2018
GTD-07b Part 1 (E/C) (BMDS Ground Test)	4	2018	4	2018
FT0-03 E1 (OTA, Intercept Flight Test)	4	2018	4	2018
JFTM-5 E1 (AEGIS 5.1, Intercept Flight Test)	4	2018	4	2018
JFTM-5 E2 (AEGIS 5.1, Intercept Flight Test)	4	2018	4	2018
GTI-ISR (18) (BMDS Ground Test)	1	2019	1	2019
FTM-31 (AEGIS SBT, Intercept Flight Test)	1	2019	1	2019
GTD-07b Part 2 (N/P) (BMDS Ground Test)	2	2019	2	2019
FT0-03 E2 (OTA, Intercept Flight Test)	2	2019	2	2019
FTM-32 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
FTX-23 (AEGIS 5.1, Target Only Flight Test)	4	2019	4	2019
FEV-02 (FTM-DST 2) (AEGIS 5.0, Intercept Flight Test)	4	2019	4	2019
GTI-08 (E/C) (BMDS Ground Test)	4	2019	1	2020
GTD-08 Part 1 (E/C) (BMDS Ground Test)	4	2019	1	2020
Warfighter TP 07b (BMDS Ground Test)	1	2020	1	2020
GTI-08 (N/P) (BMDS Ground Test)	2	2020	2	2020
JFTM-7 E1 (AEGIS 5.1, Intercept Flight Test)	2	2020	2	2020
JFTM-7 E2 (AEGIS 5.1, Intercept Flight Test)	2	2020	2	2020
FTM-30 (AEGIS 5.1, Intercept Flight Test)	4	2020	4	2020
FTM-24 (AEGIS 5.0 Intercept Flight Test)	3	2020	3	2020
GTD-08 Part 2 (N/P) (BMDS Ground Test)	1	2021	1	2021
GT-21 Sprint 1 (BMDS Ground Test)	1	2021	1	2021
Warfighter TP 08 (BMDS Ground Test)	2	2021	2	2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MT09 / <i>AEGIS BMD Test</i>
--	---	--

Events	Start		End	
	Quarter	Year	Quarter	Year
GT-21 Sprint 2 (BMDS Ground Test)	2	2021	2	2021
GT-21 Sprint 3 (BMDS Ground Test)	2	2021	3	2021
FTM-38 (AEGIS 5.0, Intercept Flight Test)	3	2021	3	2021
GT-21 Sprint 4 (BMDS Ground Test)	3	2021	3	2021
GTI-ISR (21) (BMDS Ground Test)	3	2021	3	2021
GT-21 Sprint 5 (BMDS Ground Test)	4	2021	4	2021
GT-21 Sprint 6 (BMDS Ground Test)	4	2021	4	2021
GT-22 Sprint 1 (BMDS Ground Test)	1	2022	1	2022
GT-22 Sprint 2 (BMDS Ground Test)	2	2022	2	2022
GT-22 Sprint 3 (BMDS Ground Test)	2	2022	2	2022
FTM-35 (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
FTM-37 (IOT&E) (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
GT-22 Sprint 4 (BMDS Ground Test)	3	2022	3	2022
GTD-22 (E/C) (BMDS Ground Test)	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604878C / Aegis BMD Test				Project (Number/Name) MD40 / Program Wide Support			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: Program Wide Support	-	2.425	4.059	5.692	-	5.692	3.511	3.836	5.497	4.673	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2016, Program Wide Support (PWS) was proportionately allocated to Aegis BMD Test. In FY 2017 and FY 2018, PWS reflects a proportional change as a result an increase in Aegis BMD Test.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	2.425	4.059	5.692
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: - Beginning in FY 2016, Program Wide Support was redistributed across RDT&E Program Elements with a proportional allocation to Aegis BMD Test			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	2.425	4.059	5.692

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	---	--

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / Aegis BMD Test	Project (Number/Name) MD40 / Program Wide Support
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, VA	0.000	0.036		0.081	Jul 2017	0.150	Jul 2018	-		0.150	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	Various : MDA Multi: AL, CO, CA, VA,	0.000	0.000		2.414	Nov 2016	2.784	Nov 2017	-		2.784	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (FFP)	C/FFP	Various : Multi: AL, CA, CO, VA	0.000	2.389		1.563	Jun 2017	2.725	Jun 2018	-		2.725	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPR)	MIPR	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.001	Dec 2016	0.033	Dec 2017	-		0.033	Continuing	Continuing	Continuing
Subtotal			0.000	2.425		4.059		5.692		-		5.692	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	2.425	4.059	5.692	-	5.692	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / <i>Aegis BMD Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	---	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	60.048	83.597	83.250	84.239	-	84.239	65.886	76.218	68.231	56.579	Continuing	Continuing
MT11: <i>BMDS Radars Test</i>	60.048	79.839	78.430	80.837	-	80.837	62.719	72.677	64.937	53.872	Continuing	Continuing
MD40: <i>Program Wide Support</i>	-	3.758	4.820	3.402	-	3.402	3.167	3.541	3.294	2.707	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

MDA Sensors executes a robust test program that includes flight and ground tests to support both strategic and regional BMDS capabilities against medium- and long-range threats. The Sensors elements of the Ballistic Missile Defense System (BMDS) Integrated Master Test Plan (IMTP) are intended to demonstrate the integrated missile defense capabilities under development to ensure the capabilities delivered to the Warfighter are operationally effective, suitable, and survivable. The Sensors Test Program Element specifically includes the planning, execution, and analysis of flight and ground tests and the associated infrastructure.

The Sensors test program (FY 2016-2018) provides data required for the Technical Capability Declaration for EPAA Phase III Robust Intermediate Range Ballistic Missile (IRBM) Defense, Enhanced Homeland Defense, and Mid-term discrimination improvements. It also supports Operational Test and Evaluation of the regional and strategic BMDS architecture that will be fielded at the end of Calendar Year 2018 (CY 2018).

The Sensors test program (FY 2019-2021) will support Long Range Discrimination Radar (LRDR) integration into BMDS, GMD Redesigned Kill Vehicle (RKV) developmental testing, Mid- and Far-term discrimination improvements, and Operational Test and Evaluation of the theater/regional and strategic BMDS architecture that will be fielded at the end of Calendar Year 2021 (CY 2021).

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	83.597	83.250	87.346	-	87.346
Current President's Budget	83.597	83.250	84.239	-	84.239
Total Adjustments	0.000	0.000	-3.107	-	-3.107
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	-3.107	-	-3.107

Change Summary Explanation

The decrease in FY2018 from PB17 to PB18 reflects a schedule change to align with the Integrated Master Test Plan (IMTP).

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT11: <i>BMDS Radars Test</i>	60.048	79.839	78.430	80.837	-	80.837	62.719	72.677	64.937	53.872	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

This project provides activities for planning, analysis and execution of BMDS flight test events, including pre- and post-test ground testing such as Digital and Hardware-in-the-Loop (HWIL) Pre-Mission Tests (PMTs) and Post-Flight Reconstruction (PFR). Sensor's Test provides planning, analysis and execution for BMDS system level ground tests identified in the Integrated Master Test Plan (IMTP). Test infrastructure funding provides for HWIL labs and program management required to operate and maintain a flight and ground test capability.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Flight Test Execution	34.297	32.834	35.634
Articles:	-	-	-
Description: Flight Test Execution includes test planning, pre-flight analysis, transportation of radars, test execution, and post-flight analysis for Sensors participation in BMDS Flight Tests in accordance with the BMDS Integrated Master Test Plan (IMTP). Specific and/or unique accomplishments to each FY are as follows:			
FY 2016 Accomplishments:			
-Completed Sensors participation in FTO-03 E2a, GM CTV-02+, and FTX-21.			
-Continued planning Sensors participation in FTG-15.			
-Continued planning Sensors participation in FTT-18 and FTT-15.			
FY 2017 Plans:			
SEE ABOVE			
FY 2018 Plans:			
SEE ABOVE			

Title: Ground Test Execution	23.441	27.686	28.500
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Description: Ground Test Execution includes event planning, asset integration, execution and post-mission analysis for Sensors participation in BMDS Ground Tests in accordance with the BMDS Integrated Master Test Plan. Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2016 Accomplishments: -Completed Sensors participation in the GT-06 campaign, GTI-ISR(16), and GT-07a Early Integration Event -Continued planning Sensors participation in the GT-07a campaign</p> <p>FY 2017 Plans: SEE ABOVE</p> <p>FY 2018 Plans: SEE ABOVE</p>			
<p>Title: Test Resources</p> <p align="right">Articles:</p> <p>Description: Test Resources efforts include configuration and maintenance of Sensors Hardware-in-the-Loops (HWILs) for use in Ground Test execution (BMDS and element developmental testing) and in BMDS Flight Test Execution Pre-Mission Testing. Test Resources also provide support for evolving Objective Stimulation Framework (OSF) (software upgrades) integration into the BMDS HWIL Ground Test Execution and Flight Test Execution. Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2016 Accomplishments: -Completed support for Single Stimulation Framework (SSF) (software upgrades) integration into the BMDS HWIL Ground Test Execution -Supported cyber security initiatives for the BMDS Missile Defense Agency Windows 10 implementation</p> <p>FY 2017 Plans: SEE ABOVE</p> <p>FY 2018 Plans: SEE ABOVE</p>	22.101 -	17.910 -	16.703 -
Accomplishments/Planned Programs Subtotals	79.839	78.430	80.837

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	
			Base	OCO	Total					Complete	Total Cost
• 0603179C: <i>Advanced C4ISR</i>	9.661	3.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0	13.287
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603898C: <i>Ballistic Missile Defense Joint Warfighter Support</i>	47.566	47.776	48.954	-	48.954	49.524	52.628	53.573	54.636	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	81.265	93.287	130.695	-	130.695	114.545	126.250	97.666	97.659	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0604873C: <i>Long Range Discrimination Radar (LRDR)</i>	132.278	173.162	357.659	-	357.659	135.187	52.218	50.843	119.803	Continuing	Continuing
• 13999903: <i>Planning and Design, Defense Wide</i>	0.000	8.233	8.397	-	8.397	8.525	8.822	0.000	0.000	Continuing	Continuing
• D1400634: <i>Upgrade Early Warning Radar (UEWR), Clear AFS, AK</i>	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	0

Remarks

D. Acquisition Strategy

Test & Evaluation projects use multiple existing development contracts depending on the system(s) involved in the testing.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Flight Test Execution - AN/TPY-2 & SBX FT	SS/CPFF	Raytheon : MA	22.332	22.811		12.260	Mar 2017	21.943	Mar 2018	-		21.943	Continuing	Continuing	Continuing
Flight Test Execution - FT Security, Site Activation & Deployments	Various	Various : HI, CO, AL	3.356	11.486		10.202	Jan 2017	12.507	Jan 2018	-		12.507	Continuing	Continuing	Continuing
Flight Test Execution - LRDR FT	SS/TBD	Lockheed Martin : NJ	0.000	0.000		0.000		0.032	Nov 2017	-		0.032	Continuing	Continuing	Continuing
Flight Test Execution - UEWR/CD FT	C/FPIF	deciBel : AL	0.000	0.000		10.372	Nov 2016	1.152	Nov 2017	-		1.152	Continuing	Continuing	Continuing
Ground Test Execution - AN/TPY-2 & SBX GT	SS/CPFF	Raytheon : MA	15.574	19.117	Nov 2015	13.714	Feb 2017	20.518	Feb 2018	-		20.518	Continuing	Continuing	Continuing
Ground Test Execution - UEWR/CD GT	C/FPIF	deciBel : AL	2.893	4.324	Jan 2016	13.972	Jan 2017	7.982	Jan 2018	-		7.982	Continuing	Continuing	Continuing
Test Resources - AN/TPY-2 & SBX SSF Integration & Infrastructure, Sys Test Lab	SS/CPFF	Raytheon : MA	11.119	16.315	Dec 2015	14.121	Dec 2016	12.770	Dec 2017	-		12.770	Continuing	Continuing	Continuing
Test Resources - Cyber Win10 Implementation - MDDC Lab Analysis Infrastructure	C/IDIQ	Analytical Services, Inc. : AL	0.000	0.825	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>
--	--	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Resources - Cybersecurity - BGTC and SBIRS	C/IDIQ	Northrop Grumman Space & Mission System : CO	0.000	1.600	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Resources - Cybersecurity - Tactical Communication Environment Segment (TCES)	MIPR	SPAWAR : CA	0.000	0.190	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Resources - UEWR SSF Integration & Infrastructure, Sys Test Lab	C/FPIF	deciBel : AL	4.774	3.171	Nov 2015	3.789	Nov 2016	3.933	Nov 2017	-		3.933	Continuing	Continuing	Continuing
Subtotal			60.048	79.839		78.430		80.837		-		80.837	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	60.048	79.839	78.430	80.837	-	80.837	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>
--	--	--

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Complete Activity ◆		System Level Test Planned ○		Planned Activity ◇	
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
GM CTV-02 Plus (GM, Intercept Flight Test)	▲													
FTX-21 (AEG IS SBT, Target Only Flight Test)		◆												
GTI-06 Part 2 (BMDS Ground Test)		◆												
GTI-ISR (16) (BMDS Ground Test)		◆												
GTD-06 Part 2 (BMDS Ground Test)			◆											
FTG-15 (GM, Intercept Flight Test)						△								
GTI-07a (BMDS Ground Test)						◇	◇							
GTD-07a (BMDS Ground Test)						◇								
FTM-29 (AEGIS 5.1, Intercept Flight Test)							△							
FTX-35 (TH, Target Only Flight Test)							△							
FTX-36 (TH, Patriot Target Only Flight Test)							△							
GTI-07b (E/C) (BMDS Ground Test)							◇	◇						
FT0-03 E1 (OTA, Intercept Flight Test)							△							
FTG-11 (IOT&E) (GM, Intercept Flight Test)								△						
GTD-07b (E/C) (BMDS Ground Test)								◇	◇					
GTI-07b (N/P) (BMDS Ground Test)									◇					
GTI-ISR (18) (BMDS Ground Test)									△					
FT0-03 E2 (OTA, Intercept Flight Test)									△					
GTD-07b (N/P) (BMDS Ground Test)									◇	◇				
FTX-23 (AEGIS 5.1, Target Only Flight Test)										△				
FTX-27 (SN, Target Only Flight Test)										△				
GTI-08 (E/C) (BMDS Ground Test)									◇	◇				
GTI-08 (N/P)(BMDS Ground Test)											◇	◇		
FTT-19 (TH, Intercept Flight Test)													△	

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>
--	--	--

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
GTD-08 (E/C) (BMDS Ground Test)										◇	◇			
GTD-08 (N/P) (BMDS Ground Test)											◇			
GT-21 Sprint 1 (BMDS Ground Test)											◇			
FTG-17 (IOT&E) (GM, Intercept Flight Test)											△			
GT-21 Sprint 2 (BMDS Ground Test)												◇		
GT-21 Sprint 3 (BMDS Ground Test)												◇	◇	
FTX-26 (SN, Target Only Flight Test)												△		
GT-21 Sprint 4 (BMDS Ground Test)												◇		
GTI-ISR (21) (BMDS Ground Test)												◇		
FTT-21 (TH, Intercept Flight Test)													△	
GT-21 Sprint 5 (BMDS Ground Test)												◇		
GT-21 Sprint 6 (BMDS Ground Test)												◇		
FTG-18 (GM, Intercept Flight Test)													△	
GT-22 Sprint 1 (BMDS Ground Test)													◇	
GT-22 Sprint 2 (BMDS Ground Test)														◇
GT-22 Sprint 3 (BMDS Ground Test)														◇
FTM-35 (AEGIS 5.1, Intercept Flight Test)														△
FTX-28 E1 (TH, Target Only Flight Test)														△
FTX-28 E2 (TH, Target Only Flight Test)														△
FTX-28 E3 (TH, Target Only Flight Test)														△
GT-22 Sprint 4 (BMDS Ground Test)														◇
GTD-22 (E/C) (BMDS Ground Test)														◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GM CTV-02 Plus (GM, Intercept Flight Test)	2	2016	2	2016
FTX-21 (AEG IS SBT, Target Only Flight Test)	3	2016	3	2016
GTI-06 Part 2 (BMDS Ground Test)	3	2016	3	2016
GTI-ISR (16) (BMDS Ground Test)	3	2016	3	2016
GTD-06 Part 2 (BMDS Ground Test)	4	2016	4	2016
FTG-15 (GM, Intercept Flight Test)	3	2017	3	2017
GTI-07a (BMDS Ground Test)	3	2017	4	2017
GTD-07a (BMDS Ground Test)	4	2017	4	2017
FTM-29 (AEGIS 5.1, Intercept Flight Test)	1	2018	1	2018
FTX-35 (TH, Target Only Flight Test)	2	2018	2	2018
FTX-36 (TH, Patriot Target Only Flight Test)	2	2018	2	2018
GTI-07b (E/C) (BMDS Ground Test)	2	2018	3	2018
FT0-03 E1 (OTA, Intercept Flight Test)	3	2018	3	2018
FTG-11 (IOT&E) (GM, Intercept Flight Test)	4	2018	4	2018
GTD-07b (E/C) (BMDS Ground Test)	4	2018	1	2019
GTI-07b (N/P) (BMDS Ground Test)	1	2019	1	2019
GTI-ISR (18) (BMDS Ground Test)	1	2019	1	2019
FT0-03 E2 (OTA, Intercept Flight Test)	2	2019	2	2019
GTD-07b (N/P) (BMDS Ground Test)	3	2019	4	2019
FTX-23 (AEGIS 5.1, Target Only Flight Test)	4	2019	4	2019
FTX-27 (SN, Target Only Flight Test)	4	2019	4	2019
GTI-08 (E/C) (BMDS Ground Test)	4	2019	1	2020

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MT11 / <i>BMDS Radars Test</i>
--	--	--

Events	Start		End	
	Quarter	Year	Quarter	Year
GTI-08 (N/P)(BMDS Ground Test)	2	2020	3	2020
FTT-19 (TH, Intercept Flight Test)	3	2020	3	2020
GTD-08 (E/C) (BMDS Ground Test)	3	2020	4	2020
GTD-08 (N/P) (BMDS Ground Test)	1	2021	1	2021
GT-21 Sprint 1 (BMDS Ground Test)	1	2021	1	2021
FTG-17 (IOT&E) (GM, Intercept Flight Test)	1	2021	1	2021
GT-21 Sprint 2 (BMDS Ground Test)	2	2021	2	2021
GT-21 Sprint 3 (BMDS Ground Test)	2	2021	3	2021
FTX-26 (SN, Target Only Flight Test)	3	2021	3	2021
GT-21 Sprint 4 (BMDS Ground Test)	3	2021	3	2021
GTI-ISR (21) (BMDS Ground Test)	3	2021	3	2021
FTT-21 (TH, Intercept Flight Test)	4	2021	4	2021
GT-21 Sprint 5 (BMDS Ground Test)	4	2021	4	2021
GT-21 Sprint 6 (BMDS Ground Test)	4	2021	4	2021
FTG-18 (GM, Intercept Flight Test)	1	2022	1	2022
GT-22 Sprint 1 (BMDS Ground Test)	1	2022	1	2022
GT-22 Sprint 2 (BMDS Ground Test)	2	2022	2	2022
GT-22 Sprint 3 (BMDS Ground Test)	2	2022	2	2022
FTM-35 (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
FTX-28 E1 (TH, Target Only Flight Test)	3	2022	3	2022
FTX-28 E2 (TH, Target Only Flight Test)	3	2022	3	2022
FTX-28 E3 (TH, Target Only Flight Test)	3	2022	3	2022
GT-22 Sprint 4 (BMDS Ground Test)	3	2022	3	2022
GTD-22 (E/C) (BMDS Ground Test)	4	2022	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program Wide Support</i>	-	3.758	4.820	3.402	-	3.402	3.167	3.541	3.294	2.707	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Beginning in FY 2016, Program Wide Support (PWS) was proportionately allocated to Ballistic Missile Defense Sensor Test. In FY 2017 and FY 2018 Program Wide Support reflects proportional changes as a result of budget changes to the Ballistic Missile Defense Sensor Test Program.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	3.758	4.820	3.402
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: - Beginning in FY 2016, Program Wide Support was redistributed across RDT&E Program Elements with a proportional allocation to Ballistic Missile Defense Sensor Test			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	3.758	4.820	3.402

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency											Date: May 2017				
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>					Project (Number/Name) MD40 / <i>Program Wide Support</i>				

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, VA	0.000	0.000		0.096	Jul 2017	0.068	Jul 2018	-		0.068	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	MIPR	Various : Multi: AL, VA	0.000	3.758		4.724	Aug 2017	3.334	Aug 2018	-		3.334	Continuing	Continuing	Continuing
Subtotal			0.000	3.758		4.820		3.402		-		3.402	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	3.758	4.820	3.402	-	3.402	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / <i>Ballistic Missile Defense Sensor Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1,063.459	29.288	43.293	30.486	-	30.486	31.816	33.024	31.707	30.924	Continuing	Continuing
MD68: <i>AEGIS Ashore</i>	1,028.380	27.773	41.548	26.477	-	26.477	29.787	30.990	29.676	28.944	Continuing	Continuing
MC68: <i>Cyber Operations</i>	-	0.000	0.000	2.643	-	2.643	0.500	0.500	0.500	0.500	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	35.079	1.515	1.745	1.366	-	1.366	1.529	1.534	1.531	1.480	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Decrease from FY2017 to FY2018 is due to reduced Poland site activation activities including: Aegis Weapon System transportation, site laydown area, and reduced material handling services.

A. Mission Description and Budget Item Justification

This program supports development of a Land-Based Standard Missile-3 (LBSM3) capability, hereafter referred to as Aegis Ashore. On 17 September 2009, the President announced an overarching plan to provide regional missile defense to U.S. deployed forces, allies and partners in Europe called the European Phased Adaptive Approach (EPAA). The EPAA policy specifically defines a timeline to deploy a mix of afloat and land-based Ballistic Missile Defense (BMD) capabilities. Aegis Ashore represents one of these land-based capabilities. The U.S. can also build on current efforts to pursue Phased Adaptive Approaches (PAAs) in the Asia Pacific and the Middle East regions. The PAA tailors U.S. BMD capabilities to specific theater needs enhancing integrated regional missile defenses to protect defended assets against medium, intermediate, and ultimately intercontinental range ballistic missiles.

Aegis Ashore is a key component of EPAA Phases II (Romania) and III (Poland) and provides Aegis BMD capability against short to intermediate range ballistic missiles in an ashore configuration. Aegis Ashore provides sophisticated engagement strategies and can adapt to threat updates while also being deployed/redeployed worldwide where needed to provide persistent coverage for the Geographic Combatant Commanders. Aegis Ashore re-hosts the required BMD components of a US Navy Destroyer, including: SPY-1 Radio Direction and Ranging (Radar); Vertical Launch System (VLS), Computing Infrastructure; Command Control; Communications; Computers and Intelligence (C4I) Systems; and Operator Consoles.

This program element will continue to modernize, develop, and test Aegis Ashore capability improvements at Aegis Ashore Missile Defense Test Complex (AAMDTC) in Hawaii for implementation at operational sites.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	34.970	43.293	29.045	-	29.045
Current President's Budget	29.288	43.293	30.486	-	30.486
Total Adjustments	-5.682	0.000	1.441	-	1.441
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-4.920	0.000			
• SBIR/STTR Transfer	-0.762	0.000			
• Other Adjustment	0.000	0.000	1.441	-	1.441

Change Summary Explanation

The increase in FY2018 from PB17 to PB18 is due to AAMDTC site modernizations and cyber security requirements.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>				Project (Number/Name) MD68 / <i>AEGIS Ashore</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD68: <i>AEGIS Ashore</i>	1,028.380	27.773	41.548	26.477	-	26.477	29.787	30.990	29.676	28.944	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2017 to FY 2018 due to site activation activities including: Aegis Weapon System transportation, site laydown area, and reduced material handling services.

A. Mission Description and Budget Item Justification

Deployed sites, referred to as an Aegis Ashore Missile Defense System (AAMDS), will be modified to support future computer program and missile variants in step with the U.S. Navy's Destroyer Modernization Plan. MDA is responsible for maintaining and modernizing the test center at the Pacific Missile Range Facility (PMRF), while the Navy is responsible for maintaining and modernizing all deployed Aegis Ashore sites. The initial AAMDS deployed to Romania in 2015 employing Aegis BMD 5.0 CU (Capabilities Upgrade) and SM-3 Block IB. A second AAMDS deploys to Poland and is scheduled to become operational in 2018. These sites provide an Aegis Ashore exo-atmospheric defense against short to intermediate-range ballistic missile threats in the later stages of flight. If the threat dictates, additional systems can be purchased and deployed globally.

Research and Development efforts include: required modifications to adapt the Aegis Weapon System for land based use, modernization in pace with the U.S. Navy's Destroyer Modernization Plan, development and testing of Aegis Ashore capability improvements at the Aegis Ashore Missile Defense Test Complex (AAMDTC) in Hawaii, and modifications, as required, to enhance co-existence with Broadband Wireless Access systems in the European theater.

In support of EPAA Phase III, Aegis Ashore integrates the Aegis BMD 5.1 and Standard Missile (SM-3) Block IIA capabilities into the Aegis Ashore sites. MDA is responsible for any upgrade to BMD capability, BMD specific mission equipment, and integration with existing Ballistic Missile Defense System (BMDS) nodes for all Aegis Ashore sites.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Aegis Weapon System Development	16.568	23.184	17.428
Articles:	-	-	-
Description: This effort maintains and modernizes the AAMDTC at the PMRF in Hawaii. It also develops and tests Aegis Ashore capability improvements prior to implementation at operational sites, and supports SPY-1 Radar and Broadband Wireless Access (BWA) coexistence efforts at Aegis Ashore sites.			
Specific and/or unique accomplishments to a FY are as follows:			
FY 2016 Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>	Project (Number/Name) MD68 / <i>AEGIS Ashore</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>Decrease in funding from FY 2015 to FY 2016 is due to the completion of Aegis Ashore fielding in Romania. Future Aegis Ashore sites transition to Procurement as the life cycle of the program continues to evolve.</p> <ul style="list-style-type: none"> - Continued to research SPY-1 and BWA system coexistence in the European Theater - Developed and implemented required modifications to enhance coexistence of these systems - Provided developmental support to maintain the Romania AAMDS Weapon Systems - Modernized the AAMDTC Weapons System, C4I, VLS, and other equipment to align with the U.S. Navy's Destroyer Modernization Plan and ensured the test site configuration is ready to support BMDS testing <p>FY 2017 Plans: Increase from FY 2016 to FY 2017 is due to alignment with additional U.S. Navy Destroyer Modernization efforts.</p> <ul style="list-style-type: none"> - Provide system engineering and evaluation of the U.S. Navy's Technical Instruction-16 (TI-16) technology refresh and follow-on modernization efforts concurrent to the U.S Navy's release of their Technical Data Package - Determine the minimum hardware refresh of element components and spares that are projected to be removed from production to ensure the test capability at PMRF remains current with the U.S Navy's Destroyer Modernization efforts - Provide system engineering, technical, and logistics support for the AAMDS facility and tactical elements to ensure appropriate system adaptation, readiness, availability, and effectiveness - Develop Aegis Ashore tactics, techniques, and procedures - Comply with applicable Core Standards, system requirements, regulations, and specifications <p>FY 2018 Plans: Decrease from FY 2017 to FY 2018 is due to alignment with the U.S. Navy's Destroyer Modernization schedule, to include less hardware purchases.</p> <ul style="list-style-type: none"> - Determine the minimum hardware refresh of element components and spares that are projected to be removed from the production to ensure the test capability at AAMDTC remains current with the U.S Navy's Destroyer Modernization efforts - Provide system engineering, technical, and logistics support for the AAMDS facility and tactical elements to ensure appropriate system adaptation, readiness, availability, and effectiveness - Modernize the AAMDTC Weapons System, C4I, VLS, and other equipment to align with the U.S. Navy's Destroyer Modernization Plan and ensure the test site configuration is ready to support BMDS testing - Maintain Aegis Ashore Technical Data Package with modernization implementation to include drawings and installation plans for U.S. Navy use in implementation at operational sites 				
Title: Site Activation		11.205	18.364	9.049
Articles:		-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>	Project (Number/Name) MD68 / <i>AEGIS Ashore</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	----------------	----------------	----------------

Description: This effort includes site design; environmental studies; unexploded ordnance clearing; spectrum analysis studies; temporary facilities; utilities; administrative communications equipment and services; infrastructure modifications; generator and commercial power; leased vehicles; material handling equipment; generator fuel; supplies, barriers; guard shacks; temporary lighting; transportation of materials and equipment; translators; and emerging requirements as site activation progresses and until sites are transferred to the Navy.

Recurring Accomplishments include:

- Provide site activation for Aegis Ashore site in Poland to include temporary site activation facilities, base operation support, utilities, administrative communications, on-site material handling equipment services, and equipment installation

FY 2016 Accomplishments:

- Conducted activities listed in Description section (above)
- Completed Romania Aegis Ashore site activation and demobilized temporary facilities and equipment
- Closed out all site activation activities for Romania
- Designed, purchased, and installed an integrated electronic security system for Poland Aegis Ashore site security

FY 2017 Plans:

Increase from FY 2016 to FY 2017 is to transport the Aegis Weapon System to Poland

- Conducted activities listed in Description section (above)
- Provide fuel for facility commissioning activities
- Ship the Aegis Weapon System and associated equipment to Poland as second destination transportation via the military transportation system
- Continue to provide Defense Threat Reduction Agency (DTRA) support to ensure High-Altitude Electromagnetic-Pulse (HEMP) validation and verification testing is completed
- Provide on-call unexploded ordnance technical support to ensure unexpected items do not affect site work and construction schedule
- Provide post-award technical services (structural, mechanical, and electrical) to ensure quality standards and construction schedule are met
- Provide technical support to facilitate processing facility change proposals and construction modifications

FY 2018 Plans:

Decrease from FY 2017 to FY 2018 is due to reduced site activation activities to include: Aegis Weapon System transportation, site laydown area, and reduced material handling services.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>	Project (Number/Name) MD68 / <i>AEGIS Ashore</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Conducted activities listed in Description section (above) - Continue providing fuel for facility commissioning activities, backup generators, and on-site vehicle support - Provide technical support to facilitate processing facility change proposals and construction modifications - Provide on-call unexploded ordnance technical support to ensure unexpected items do not affect site work and construction schedule - Provide post-award technical services (structural, mechanical, and electrical) to ensure quality standards and construction schedule is met - Provide Defense Threat Reduction Agency (DTRA) support to ensure High-Altitude Electromagnetic Pulse (HEMP) validation and verification testing is completed 			
Accomplishments/Planned Programs Subtotals	27.773	41.548	26.477

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0208866C: <i>PROCUREMENT</i>	1,489.203	1,139.503	1,178.364	-	1,178.364	1,576.815	1,535.529	1,522.410	1,555.094	0	9,996.918
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0604878C: <i>Aegis BMD Test</i>	78.468	95.012	134.468	-	134.468	73.059	82.570	113.856	97.660	Continuing	Continuing
• 0604881C: <i>AEGIS SM-3 Block IIA Co-Development</i>	165.456	106.038	9.739	-	9.739	0.000	0.000	0.000	0.000	0	281.233

Remarks

D. Acquisition Strategy

Aegis Ashore awarded a contract for an Aegis Ashore Engineering Agent (AAEA). The AAEA is responsible for the design, development, integration and test of the Aegis Weapons System capability into a reconstitutable deckhouse. The AAEA will also support Aegis Ashore deployment to Romania.

The Global Deployment (GD) program office is utilizing Naval Facilities Engineering Command (NAVFAC) and U. S. Corps of Engineers Europe District (Core of Engineers North Atlantic Union) CENAU to award and administer contracts for base operating support, commercial power, temporary site activation facilities, and integrated electronic security systems for Romania and Poland sites.

E. Performance Metrics

Cost Plus Award Fee Contracts

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)	Project (Number/Name) MD68 / AEGIS Ashore
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Aegis Weapon System Development - AWS Development-NAVSEA-MD68	MIPR	NAVSEA-LM/BAE, SPAWAR, NSWC CD : San Diego, CA; Baltimore, MD; Minneapolis, MN	3.934	1.228	Nov 2015	1.500	Nov 2016	5.000	Nov 2017	-		5.000	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-NSWC DD-MD68	MIPR	NSWC Dahlgren : Dahlgren, VA	45.753	0.263	Nov 2015	3.000	Nov 2016	2.400	Nov 2017	-		2.400	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-NSWC PHD-MD68	MIPR	NSWC PHD, NSWC, DOI, Aegis Techrep : CA, NJ, ID, MD, IN	34.800	0.593	Nov 2015	7.480	Nov 2016	1.803	Nov 2017	-		1.803	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-PMRF - MD68	MIPR	PMRF : Hawaii	8.212	3.219	Nov 2015	5.704	Nov 2016	1.225	Nov 2017	-		1.225	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-SPAWAR-MD68	MIPR	SSC PAC : San Diego, CA	40.112	3.595	Nov 2015	5.500	Nov 2016	7.000	Nov 2017	-		7.000	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-Variou-MD68: No longer funding in the FYDP	Various	Various : AL, VA, CA, APO, HI, NJ	834.565	0.486		0.000		0.000		-		0.000	0	835.051	0
Aegis Weapon System Development - Aegis Weapon System Development - MD68-	SS/CPHF	MDA Lockheed Martin : Moorestown, NJ	7.184	7.184		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Weapon System Development - MD68 - D	MIPR	MDA : Arlington, VA	1.076	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Site Activation - DTRA support to construction in Romania and Poland	MIPR	DTRA : Ft. Belvoir, VA	0.350	0.000		0.315	Oct 2016	0.300	Nov 2017	-		0.300	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)	Project (Number/Name) MD68 / AEGIS Ashore
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Site Activation - Poland Admin Communication	MIPR	Northrop Grumman : Poland	0.000	1.300		0.778	Nov 2016	0.602	Nov 2017	-		0.602	Continuing	Continuing	Continuing
Site Activation - Poland Base Operating Support and Commercial Power Contract Development	MIPR	NAVFAC : Poland	0.064	1.888		3.321	Dec 2016	2.328	Nov 2017	-		2.328	Continuing	Continuing	Continuing
Site Activation - Poland IESS	MIPR	CENAU : Poland	0.000	2.975		0.000		0.000		-		0.000	0	2.975	0
Site Activation - Poland Temp Facilities Design & Contract Development	MIPR	USACE : Huntsville, AL	0.350	2.404		0.000		0.000		-		0.000	0	2.754	0
Site Activation - Romania Admin Communications	MIPR	DISA, Scott AFB, : IL	0.513	0.013		0.000		0.000		-		0.000	0	0.526	0
Site Activation - Romania Base Support Services	MIPR	NAVFAC : Poland	6.445	0.600		0.000		0.000		-		0.000	0	7.045	0
Site Activation - Romania Integrated Electronic Security System - MD68	MIPR	USACE : Huntsville, AL	3.655	0.900		0.000		0.000		-		0.000	0	4.555	0
Site Activation - Romania Temp Facilities	MIPR	CENAU : Romania	0.049	1.125		0.000		0.000		-		0.000	0	1.174	0
Site Activation - Site Activation - MD68	MIPR	Various : Various	41.318	0.000		0.000		0.000		-		0.000	0	41.318	0
Site Activation - Site Activation - Transportation of Aegis Weapon System	MIPR	SDDC : Scotts AFB, IL	0.000	0.000		4.629	Jan 2017	0.872	Nov 2017	-		0.872	Continuing	Continuing	Continuing
Site Activation - Site Activation- Poland Admin Communications	MIPR	DISA : Scott AFB, IL	0.000	0.000		0.075	Nov 2016	0.160	Nov 2017	-		0.160	Continuing	Continuing	Continuing
Site Activation - Site Activation- Poland Material Handling Services	MIPR	NAVFAC : Naples, Italy	0.000	0.000		6.060	Nov 2016	2.195	Nov 2017	-		2.195	Continuing	Continuing	Continuing
Site Activation - Site Activation- Poland Site Laydown	MIPR	NAVFAC : Naples, Italy	0.000	0.000		0.541	Dec 2016	0.000		-		0.000	0	0.541	0

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)	Project (Number/Name) MD68 / AEGIS Ashore
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Site Activation - USACE in-house support in Poland	MIPR	CEHNC : Huntsville, AL	0.000	0.000		0.700	Oct 2016	0.800	Oct 2017	-		0.800	Continuing	Continuing	Continuing
Site Activation - USACE support in Poland	MIPR	CENAU : Poland	0.000	0.000		1.945	Oct 2016	1.792	Oct 2017	-		1.792	Continuing	Continuing	Continuing
Subtotal			1,028.380	27.773		41.548		26.477		-		26.477	-	-	-

Remarks
Increase from FY 2017 to FY 2018 for AWS Development- SSC PAC - MD68 due to C4I upgrade procurements and installations.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)	Project (Number/Name) MD68 / AEGIS Ashore
--	---	---

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,028.380	27.773	41.548	26.477	-	26.477	-	-	-

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for inactive contracts, MIPRs, and civilian salaries on the R-3.

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>	Project (Number/Name) MD68 / <i>AEGIS Ashore</i>
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AAMDTC UpgradesFTo-03	2	2016	3	2018
Facility Support for NAVEUR Exercise	1	2018	2	2018
Facility Support for FTM-29	1	2018	2	2018
Facility Support for FTO-03 E1	2	2018	4	2018
Facility Support for GTI-07b	3	2018	4	2018
Facility Support for GTD-07b	4	2018	1	2019
Facility Support for FEV-02	4	2019	1	2020
Facility Support for FTM-31	1	2019	2	2019
Facility Support for FTM-33	3	2018	4	2018
Facility Support for FTM-32	3	2019	4	2019
Facility Support for FTX-23	4	2019	1	2020
Facility Support for FTM-35	3	2022	4	2022
Facility Support for FTM-30	4	2020	1	2021
AAMDTC Upgrades	4	2018	1	2022
Facility Support for FTM-37	3	2022	4	2022
Facility Support for FTM-38	3	2021	4	2021

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)				Project (Number/Name) MC68 / Cyber Operations			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC68: <i>Cyber Operations</i>	-	0.000	0.000	2.643	-	2.643	0.500	0.500	0.500	0.500	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase due to DoD mandated cyber requirements. Funding supports the upgrade and modernization of existing systems.

A. Mission Description and Budget Item Justification

The funds in this project sustain Missile Defense Agency (MDA) DoD Information Assurance Certification and Accreditation Program (DIACAP) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA Aegis Ballistic Missile Defense (BMD) mission systems. It maintains the Certification and Accreditation (C&A) data repository, capturing the DIACAP documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) on all MDA Information Systems.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network/System Certification and Accreditation (C&A)	0.000	0.000	2.643
Articles:	-	-	-
Description: Monitor and track cybersecurity mitigation detailed in Information Technology Security Guidance. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior Information Assurance Officer (SIAO)/ Certification Authority (CA) and DAA. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: Increase from FY 2017 to FY 2018 due to DoD mandated cyber requirements. Funding supports the upgrade and modernization of existing systems to support the requirements.			
- Conduct Fidelis Cybersecurity at PMRF: Surface hardening and protection for the Aegis Weapons System at Automated Digital Network System (ADNS)			
- Provide Cybersecurity engineering and architecture requirements planning for Aegis BMD systems			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>	Project (Number/Name) MC68 / <i>Cyber Operations</i>
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Coordinate the development and implementation of Aegis BMD Risk Management Framework (RMF) accreditation packages - Conduct regular Controls Validation Testing (CVT) of Aegis BMD systems and provide a Risk Assessment Report (RAR) to mitigate cybersecurity deficiencies - Conduct annual cybersecurity reviews on the Aegis BMD systems to assess compliance in implementing and maintaining RMF controls - Implement HW/SW to conduct continuous daily monitoring - Conduct monthly reviews of systems in eMass - Provide daily management of eMass 			
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.643

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Full and Open contract support through Missile Defense Agency Program Management Office.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)	Project (Number/Name) MC68 / Cyber Operations
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network/System Certification and Accreditation (C&A) - Cyber Operations	MIPR	PMRF : HI	0.000	0.000		0.000		2.643	Nov 2017	-		2.643	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		2.643		-		2.643	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	2.643	-	2.643	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>	Project (Number/Name) MC68 / <i>Cyber Operations</i>
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Cyber Operations	1	2018	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)				Project (Number/Name) MD40 / Program-Wide Support			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	35.079	1.515	1.745	1.366	-	1.366	1.529	1.534	1.531	1.480	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016, FY 2017, and FY 2018 Program Wide Support (PWS) reflects proportional changes as a result of budget changes to LBSM3. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	1.515	1.745	1.366
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	1.515	1.745	1.366

C. Other Program Funding Summary (\$ in Millions)

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / Land Based SM-3 (LBSM3)	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Facilities and Maintenance (MIPR)	MIPR	Various; Multi : AL, CA, CO, VA	11.024	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Facilities and Maintenance (Reqn)	Reqn	Various; Multi : AL, CA, CO, VA	4.383	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various: Multi : AL, CA, CO, VA	1.938	0.000		0.035	Jul 2017	0.027	Jul 2018	-		0.027	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	17.213	1.515		1.710	Aug 2017	1.339	Aug 2018	-		1.339	9.005	30.782	0
Program Wide Support - Agency Operations and Support, International, and Materiel and Readiness	MIPR	Department of State; : Washington, DC, Japan, Australia	0.181	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	C/CPAF	Various : Multi:AL,VA	0.340	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			35.079	1.515		1.745		1.366		-		1.366	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.079	1.515	1.745	1.366	-	1.366	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / <i>Land Based SM-3 (LBSM3)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604881C / <i>AEGIS SM-3 Block IIA Co-Development</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	2,049.969	165.456	106.038	9.739	-	9.739	0.000	0.000	0.000	0.000	0	2,331.202
MD09: <i>SM-3 Block IIA Co-Development</i>	1,974.992	132.677	91.071	8.816	-	8.816	0.000	0.000	0.000	0.000	0	2,207.556
MT09: <i>SM-3 Block IIA Co-Development Test</i>	9.365	25.186	12.208	0.000	-	0.000	0.000	0.000	0.000	0.000	0	46.759
MD40: <i>Program-Wide Support</i>	65.612	7.593	2.759	0.923	-	0.923	0.000	0.000	0.000	0.000	0	76.887

Program MDAP/MAIS Code: 362

Note

Decrease in funding from FY 2017 to FY 2018 due to finalization of the Aegis SM-3 Block IIA Co-Development Program.

A. Mission Description and Budget Item Justification

The Aegis Ballistic Missile Defense (BMD) mission is to deliver an operationally effective and supportable BMD capability to defend the nation, deployed forces, and allies. Aegis BMD aims to increase this capability by delivering evolutionary improvements as part of Ballistic Missile Defense System (BMDS) upgrades. Aegis BMD provides a forward-deployable, mobile capability to detect and track ballistic missiles of all ranges, and the ability to destroy Short-Range Ballistic Missiles (SRBM), Medium-Range Ballistic Missiles (MRBM), and Intermediate-Range Ballistic Missiles (IRBM) in the midcourse phase of flight. Upgrades to both the Aegis BMD Weapon System and the Standard Missile-3 (SM-3) configuration enable Aegis BMD to provide effective, supportable defensive capability against longer range, more sophisticated threats and an enduring Aegis Ashore defensive capability.

Beginning in 2006, Aegis BMD and the Japanese Ministry of Defense (JMOD) have undertaken an SM-3 Cooperative Development (SCD) Project. The objective of the SCD project is the development and initial at-sea flight test of the SM-3 Block IIA. The U.S. and Japan will bear equitable burden to complete the project, as documented in the U.S./Japan Memorandum of Understanding (MOU) SCD Annex. Each nation will fund the full extent of its participation in the project. No funds are transferred between the U.S. and Japan under the MOU.

The SM-3 Block IIA provides important improvements over SM-3 Block IB capability, including increased velocity and range provided by a 21-inch diameter rocket motor propulsion stack, more than doubled seeker sensitivity, and more than tripled divert capability incorporated in an advanced Kinetic Warhead (KW). New component technologies include, but are not limited to: lightweight nosecone, advanced kinetic warhead, 21-inch second stage rocket motor, and 21-inch third stage rocket motor. The effort includes risk reduction for key components and supports EPAA Phase III.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604881C / <i>AEGIS SM-3 Block IIA Co-Development</i>
---	--

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	172.645	106.038	0.000	-	0.000
Current President's Budget	165.456	106.038	9.739	-	9.739
Total Adjustments	-7.189	0.000	9.739	-	9.739
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-4.000	0.000			
• SBIR/STTR Transfer	-3.189	0.000			
• Other Adjustment	0.000	0.000	9.739	-	9.739

Change Summary Explanation

The increase in FY2018 from PB17 to PB18 provides Kinetic Warhead (KW) and Guidance Section (GS) qualification, required to complete SM-3 Block IIA Co-Development to meet EPAA Phase III time line.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development				Project (Number/Name) MD09 / SM-3 Block IIA Co-Development			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD09: SM-3 Block IIA Co-Development	1,974.992	132.677	91.071	8.816	-	8.816	0.000	0.000	0.000	0.000	0	2,207.556
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

Decrease in funding from FY2017 to FY2018 due to completion of the Kinetic Warhead and Guidance Section qualifications.

A. Mission Description and Budget Item Justification

The Scope of Work of the SCD project is defined in three phases:

Phase I took the program through System Design Review (SDR) in FY 2009. Aegis BMD executed risk reduction efforts for the Propulsion, Nosecone, Seeker, Divert Attitude Control System (DACS) development efforts, and test plans. Phase I Included requirements definition for the SM-3 Block IIA.

Phase II encompassed the work from SDR through the Critical Design Review (CDR) in FY 2014. Aegis BMD refined requirements and defined the performance allocation and component configuration for the development of the SM-3 Block IIA. The U.S. and Japan designed, fabricated, tested, and evaluated the SM-3 Block IIA sections per the agreed work-share agreement.

Phase III extends from CDR to the completion of the SCD flight test program as defined in the Agreement. This phase defines developmental cost share agreements between the United States and the Government of Japan, completes component engineering and integration, executes cooperative flight tests, and continues discussions on production and maintenance options. Phase III is planned to complete in FY 2018.

The SCD project will:

- Develop and integrate components for the SM-3 Block IIA into an All Up Round (AUR). Japan's work share includes 21 inch 2nd and 3rd stage components and the 21 inch nosecone. The U.S. work share includes the advanced kinetic warhead, advanced seeker, large diameter divert and attitude control system, and lightweight Vertical Launch System (VLS) canister.
- Integrate the SM-3 Block IIA VLS with Aegis Ship Systems.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: SM-3 Block IIA Cooperative Development (SCD)	132.677	91.071	8.816
Articles:	-	-	-
Description: This activity develops the SM-3 Block IIA which will increase the area that can be defended by Aegis Ballistic Missile Defense (BMD) and increase the probability of kill against a larger threat set. It will leverage enhanced capability provided by Ballistic Missile Defense System (BMDS) sensor upgrades.			
Recurring Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD09 / SM-3 Block IIA Co-Development

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Prepare for and support BMDS Flight Test events as reflected in the IMTP and the Exhibit R-4 schedule - Develop and deliver lightweight VLS canisters in support of SCD testing events <p>FY 2016 Accomplishments: SM-3 Block IIA Development:</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above) - Continued Software Formal Qualification testing to ensure successful flight test intercepts - Continued Integration & Test Proofing to ensure proper implementation of manufacturing processes of the SM-3 Block IIA missile - Continued qualification and testing of the Throttleable Divert and Attitude Control System (TDACS) in support of pending flight test to ensure missile components meet performance and manufacturing requirements - Continued Kinetic Warhead (KW) Qualification testing to ensure missile components meet performance and manufacturing requirements - Continued Guidance Section (GS) Qualification to ensure missile components meet performance and manufacturing requirements - Continued Kinetic Warhead (KW) and Guidance Section (GS) Post Near Miss Shock Performance Testing that provides data for missile hazard classification - Delivered TDACS and GS in support of BMDS Flight Test event - Prepared for BMDS Flight Test events as reflected in the IMTP and the Exhibit R-4 schedule <p>FY 2017 Plans: Decrease in funding from FY 2016 to FY 2017 is due to SM-3 Block IIA Co-Development completion with exception of Guidance Section (GS) and Kinetic Warhead (KW) qualification</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above) - Complete SFTM-01 & SFTM-02 missile software build and qualification - Build and deliver SFTM-01 & SFTM-02 flight test All Up Round (AUR) - Implement SM-3 Block IIA Seeker Guidance Section Evaluation Lab (GSEL) photon injection capability - Initiate SM-3 Block IIA performance verification report - Complete Software Formal Qualification testing to ensure successful flight test intercepts - Complete Integration & Test Proofing to ensure proper implementation of manufacturing processes of the SM-3 Block IIA missile - Complete qualification and testing of the Throttleable Divert and Attitude Control System (TDACS) in support of pending flight test to ensure missile components meet performance and manufacturing requirements - Continue Kinetic Warhead (KW) Qualification testing to ensure missile components meet performance and manufacturing requirements 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD09 / SM-3 Block IIA Co-Development

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Continue Guidance Section (GS) Qualification to ensure missile components meet performance and manufacturing - Continue Kinetic Warhead (KW) and Guidance Section (GS) Post Near Miss Shock Performance Testing that provides data for missile hazard classification			
<i>FY 2018 Plans:</i> Decrease in funding from FY 2017 to FY 2018 due to finalization of the Aegis SM-3 Block IIA Co-Development Program - Conducted activities listed in Description section (above) - Complete Kinetic Warhead (KW) and Guidance Section (GS) qualifications as required to complete Aegis SM-3 Block IIA Co-Development - Complete requirements verification of Japanese sections post qualification testing			
Accomplishments/Planned Programs Subtotals	132.677	91.071	8.816

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing

Remarks

D. Acquisition Strategy

The SM-3 Cooperative Development program for the SM-3 Block IIA missile utilizes a performance-based approach that ties program decision milestones to the performance of development prototypes, as well as Propulsion Test Vehicle and Controlled Test Vehicle flight test article performance. Acquisition of hardware, software modifications and required services will occur in conjunction with contractual and tasking efforts to U.S. Navy work and events, and as defined by signed agreements between the Governments of the United States and Japan.

E. Performance Metrics

SM-3 Block IIA Program Office is utilizing Incentive-based contracts to ensure project completes on time.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD09 / SM-3 Block IIA Co-Development
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SM-3 Block IIA Cooperative Development (SCD) - SM-3 Block IIA Cooperative Development (SCD) - SM-3 Blk IIA Development - MD09	SS/CPAF	RAYTHEON : AZ	1,723.515	101.920	Nov 2015	80.921	Nov 2016	8.816	Nov 2017	-		8.816	0	1,915.172	0
SM-3 Block IIA Cooperative Development (SCD) - SM-3 Block IIA Cooperative Development (SCD) - SM-3 Blk IIA Development and Canister - MD09. No longer funding in the FYDP	Various	Various : MD, VA, MA, CA, IN	251.477	30.757	Nov 2015	10.150		0.000		-		0.000	0	292.384	0
Subtotal			1,974.992	132.677		91.071		8.816		-		8.816	0.000	2,207.556	0.000

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD09 / SM-3 Block IIA Co-Development
--	---	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
N/A

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,974.992	132.677	91.071	8.816	-	8.816	0.000	2,207.556	0.000

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for all contracts.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017									
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development				Project (Number/Name) MD09 / SM-3 Block IIA Co-Development							
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇						
				FY 2016	FY 2017		FY 2018		FY 2019	FY 2020		FY 2021		FY 2022	
MD09 SM-3 Block IIA Co-Development				◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD09 / SM-3 Block IIA Co-Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD09 SM-3 Block IIA Co-Development	1	2016	4	2018

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development			Project (Number/Name) MT09 / SM-3 Block IIA Co-Development Test				
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT09: SM-3 Block IIA Co-Development Test	9.365	25.186	12.208	0.000	-	0.000	0.000	0.000	0.000	0.000	0	46.759
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

No funding needed.

A. Mission Description and Budget Item Justification

Working with the Services' Operational Test Agencies (OTA), with the support of the Director of Operational Test and Evaluation (DOT&E), MDA developed a test program to improve confidence in missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable.

The Integrated Master Test Plan (IMTP) is event-oriented and extends until the collection of all identified data is completed to ensure adequate test investments. MDA is focused on conducting meaningful ballistic missile testing that demonstrates the capabilities of the BMDS.

The MDA and the Japanese Ministry of Defense conduct the Standard Missile Cooperative Development (SCD) Project for the development and initial flight test of the SM-3 Block IIA in accordance with the jointly signed SCD Annex. The Joint signed SCD Program Schedule (dated October 2013) includes the following test events:

- * Restrained Firing - COMPLETE
- * Propulsion Test Vehicle - 1 (PTV-1) - Completed FY 2014
- * Controlled Test Vehicle - 1 (CTV-1) - Completed FY 2015
- * Controlled Test Vehicle - 2 (CTV-2) (Completed FY 2016)
- * SCD Flight Test Standard Missile (FTM) - 1 (SFTM-01) (Planned for FY2017)
- * SCD FTM - 2 (SFTM-02) (Planned for FY 2017)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: SM-3 Co-Development Flight Test Execution	25.186	12.208	0.000
Articles:	-	-	-
Description: This activity conducts ground and flight testing using the Aegis BMD 5.1 system to improve confidence in missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable.			
Recurring Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MT09 / SM-3 Block IIA Co-Development Test

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Prepare for and conduct Ballistic Missile Defense System Flight and Ground Test events as reflected in the Integrated Master Test Plan and the Exhibit R-4 schedule. - Conduct Aegis BMD-specific analyses during pre and post-mission analysis phases. <p>FY 2016 Accomplishments: The increase from FY 2015 to FY 2016 is due to the first scheduled flight test (SFTM-01) for the SM-3 Block IIA Co-Development program being conducted in first quarter FY 2017 and SFTM-02 being conducted in second quarter FY 2017.</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Begin test planning for FY 2016 Aegis flight test missions: develop models and simulations, and ready the range for test. <p>FY 2017 Plans: The decrease in funding from FY 2016 to FY 2017 is due to decreased number of tests in FY 2017.</p> <ul style="list-style-type: none"> - Conducted activities listed in Description section (above). - Conduct flight test program (SFTM-02) to meet the Aegis and SM-3 Block IIA components of the EPAA Phase III architecture. <p>FY 2018 Plans: No funds required</p>			
Accomplishments/Planned Programs Subtotals	25.186	12.208	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0604878C: <i>Aegis BMD Test</i>	78.468	95.012	134.468	-	134.468	73.059	82.570	113.856	97.660	Continuing	Continuing
• 0604880C: <i>Land Based SM-3 (LBSM3)</i>	29.288	43.293	30.486	-	30.486	31.816	33.024	31.707	30.924	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency			Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MT09 / SM-3 Block IIA Co-Development Test			

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
------------------	----------------	----------------	-------------------------------	------------------------------	--------------------------------	----------------	----------------	----------------	----------------	-----------------------------------	-------------------

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MT09 / SM-3 Block IIA Co-Development Test
--	---	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SM-3 Co-Development Flight Test Execution - SM-3 Block IIA Cooperative Development (SCD) - SM-3 Bk IIA Development - MT09. No longer funding in the FYDP	Various	Various : AZ, CA, VA, MD, HI, MA, TX	9.365	25.186	Nov 2015	12.208	Oct 2016	0.000		-		0.000	0	46.759	0
Subtotal			9.365	25.186		12.208		0.000		-		0.000	0.000	46.759	0.000

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MT09 / SM-3 Block IIA Co-Development Test
--	---	---

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.365	25.186	12.208	0.000	-	0.000	0.000	46.759	0.000

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MT09 / SM-3 Block IIA Co-Development Test
--	---	---

	Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆									
	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇									
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
SCD CTV-02 (AEGIS SCD, Intercept Only Flight Test)	▲													
SFTM-01 (AEGIS 5.1, Intercept Flight Test)						△								
SFTM-02 (AEGIS 5.1, Intercept Flight Test)						△								

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MT09 / SM-3 Block IIA Co-Development Test

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SCD CTV-02 (AEGIS SCD, Intercept Only Flight Test)	1	2016	1	2016
SFTM-01 (AEGIS 5.1, Intercept Flight Test)	1	2017	1	2017
SFTM-02 (AEGIS 5.1, Intercept Flight Test)	2	2017	2	2017

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: Program-Wide Support	65.612	7.593	2.759	0.923	-	0.923	0.000	0.000	0.000	0.000	0	76.887
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016, FY 2017 and FY 2018, Program Wide Support reflects proportional changes as a result of a decrease to SM-3 Block IIA Co-Development. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests on the R-3.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	7.593	2.759	0.923
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	7.593	2.759	0.923

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD40 / Program-Wide Support

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	Allot	Various: Multi : ALless than CAless than COless than VA	6.435	0.114		0.055	Jul 2017	0.018	Jul 2018	-		0.018	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Defense Manpower Data Center : AL,CA, CO, VA	0.009	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Service	C/CPFF	Various : Multi: AL, CA, CO, VA	11.258	0.000		2.704	Jul 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/Various	Various; Multi : AL, CO, VA	44.237	7.479	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Facilities and Maintenance	MIPR	Various: Multi : AK, AL, CA, VA	3.673	0.000		0.000		0.905	Aug 2018	-		0.905	Continuing	Continuing	Continuing
Subtotal			65.612	7.593		2.759		0.923		-		0.923	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	65.612	7.593	2.759	0.923	-	0.923	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD40 / Program-Wide Support
--	---	---

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆														
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇														
					FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
MD40 Program-Wide Support					◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604881C / AEGIS SM-3 Block IIA Co-Development	Project (Number/Name) MD40 / Program-Wide Support

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2018

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	78.463	54.619	56.481	76.757	-	76.757	74.205	69.713	77.826	79.094	Continuing	Continuing
MT08: <i>Midcourse Test</i>	78.463	51.821	53.192	73.453	-	73.453	70.638	66.474	74.069	75.309	Continuing	Continuing
MD40: <i>Program Wide Support</i>	-	2.798	3.289	3.304	-	3.304	3.567	3.239	3.757	3.785	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Increase from FY 2017 to FY 2018 is due to the Integrated Master Test Plan changes.

A. Mission Description and Budget Item Justification

Ballistic Missile Defense Midcourse Defense Segment Test provides flight and ground testing of Ground-based Midcourse Defense (GMD) functionality to demonstrate Enhanced Homeland Defense capabilities against long-range threats. The GMD components are tested in an integrated environment with Ballistic Missile Defense System (BMDS) sensors; Command & Control, Battle Management, Communications (C2BMC); Warfighters; and national collection assets to assess the ability to defend the United States and its territories against ballistic missile attack.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	64.618	56.481	86.709	-	86.709
Current President's Budget	54.619	56.481	76.757	-	76.757
Total Adjustments	-9.999	0.000	-9.952	-	-9.952
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-9.999	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	-9.952	-	-9.952

Change Summary Explanation

The decrease in FY2018 from PB17 to PB18 reflects reduced requirements for the Integrated Master Test Plan.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MT08: <i>Midcourse Test</i>	78.463	51.821	53.192	73.453	-	73.453	70.638	66.474	74.069	75.309	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Increase from FY 2017 to FY 2018 is due to Integrated Master Test Plan changes.

A. Mission Description and Budget Item Justification
Ballistic Missile Defense Midcourse Defense Segment Test provides flight and ground testing of GMD functionality to demonstrate Enhanced Homeland Defense capabilities against long-range threats. The GMD components are tested in an integrated environment with BMDS sensors; C2BMC; Warfighters; and national collection assets to assess the ability to defend the United States and its territories against ballistic missile attack.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>Title: Resources</p> <p style="text-align: right;">Articles:</p> <p>Description: Provides support associated with day-to-day operations of the flight and ground test programs to include engineering support for ground test planning, execution, and post-event reconstruction.</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> -Provided test infrastructure and coordinated flight test range support from Vandenberg Air Force Base, California for all range activities, engineering, operators and GBI transportation -Provided command and control and situational awareness for the GMD flight and ground test events at the MDA Integration and Operations Center (MDIOC) in Colorado Springs, Colorado and the Readiness and Control Facility (R&C) in Ft. Greely, Alaska -Provided test communication plans, test communication control, satellite communication bandwidth, test network certification and accreditation for GMD flight and ground tests to integrate the range in Vandenberg Air Force Base, California and MDIOC in Colorado Springs, Colorado and Ft. Greely, Alaska and Pacific Missile Range Facility (PMRF) in Hawaii -Provided engineering, operations and maintenance of the integrated system test labs in Huntsville, Alabama to conduct BMDS flight test pre-mission risk reduction and system level ground testing for fielding warfighter capabilities that defend the homeland -Provided operations and maintenance of the Prime Consolidated Integration Lab (PCIL) in Huntsville, Alabama to support flight test pre-mission risk reduction and post-flight reconstruction to provide confidence in models and simulations used for evaluation of performance of GMD homeland defense capabilities -Supported cyber security initiatives for the BMDS Missile Defense Agency Windows 10 implementation <p>FY 2017 Plans:</p>	23.216	14.196	18.250
	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-Provide test infrastructure and coordination of flight test range support from Vandenberg Air Force Base, CA for all range activities, engineering, operators and GBI transportation, including preparation for the first GBI salvo flight test</p> <p>-Provide BMDS flight and ground test execution situational awareness through the use of the MDA Integration and Operations Center (MDIOC) housing flight, ground and operational controlled assets of the GMD system located in Colorado Springs, CO</p> <p>-Support pre- and post-flight test mission communications to include fulfillment of requirements and data analyses</p> <p>-Provide System Test Lab support to the engineering, accreditation, operations and maintenance of facilities supporting the Flight and Ground Test Programs</p> <p>-Continue to provide operations and maintenance, and provide equipment upgrades of the Prime Consolidated Integration Lab (PCIL) in Huntsville, Alabama to support flight test pre-mission risk reduction and post-flight reconstruction to provide confidence in models and simulations used for evaluation of performance of GMD homeland defense capabilities</p> <p>-Continue salvo range infrastructure upgrades, which include: launch facility, range safety systems and situational awareness monitoring systems to accommodate two GBIs, at Vandenberg Air Force Base, California in preparation for the Flight Test Ground-based Midcourse Defense-11 (FTG-11)</p> <p>FY 2018 Plans:</p> <p>-Increase from FY 2017 to FY 2018 due to the Salvo intercept test requirements to support multiple interceptors: additional range support for mission execution, safety systems, and additional data collectors</p> <p>-Provide test infrastructure and coordinate flight test range support from Vandenberg Air Force Base, California for all range activities, engineering, operators and GBI transportation</p> <p>-Provide command and control and situational awareness for the GMD flight and ground test events at the MDA Integration and Operations Center (MDIOC) in Colorado Springs, Colorado and the Readiness and Control Facility (R&C) in Ft. Greely, Alaska</p> <p>-Provide test communication plans, test communication control, satellite communication bandwidth, test network certification and accreditation for GMD flight and ground tests to integrate the range in Vandenberg Air Force Base, California and MDIOC in Colorado Springs, Colorado and Ft. Greely, Alaska and Pacific Missile Range Facility (PMRF) in Hawaii</p> <p>-Provide engineering, operations and maintenance of the integrated system test labs in Huntsville, Alabama to conduct BMDS flight test pre-mission risk reduction and system level ground testing for fielding warfighter capabilities that defend the homeland</p> <p>-Continue to provide operations and maintenance, and provide equipment upgrades of the Prime Consolidated Integration Lab (PCIL) in Huntsville, Alabama to support flight test pre-mission risk reduction and post-flight reconstruction to provide confidence in models and simulations used for evaluation of performance of GMD homeland defense capabilities</p> <p>-Complete salvo range infrastructure upgrades, which include: launch facility, range safety systems and situational awareness monitoring systems to accommodate two GBIs, at Vandenberg Air Force Base, California in preparation for the Flight Test Ground-based Midcourse Defense-11 (FTG-11)</p>				
Title: Flight Test Execution		24.681	19.104	37.606

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p align="right"><i>Articles:</i></p> <p>Description: Flight tests demonstrate the capabilities and/or phenomenology that cannot be adequately tested or obtained during ground testing. Flight tests also provide opportunities to test actual hardware and to demonstrate Ballistic Missile Defense System (BMDS) Element interoperability under operationally realistic conditions.</p> <p>FY 2016 Accomplishments: -Conducted Flight Test Ground-based Midcourse Defense GM CTV-02+, a 3-stage Capability Enhancement II (CE-II) non-intercept engagement using a GBI launched from Vandenberg Air Force Base, California against an air launched Intermediate Range Ballistic Missile (IRBM) with associated objects to test the Alternate Divert Thrusters (ADT), and the Exoatmospheric Kill Vehicle (EKV) upgraded Discrimination Database (KDB) to support fielding the CEII / Block I Kill Vehicle (KV) -Continued planning for Flight Test Ground-based Midcourse Defense-15 (FTG-15), a 3-stage Configuration 2 (Consolidated Booster Avionics Upgrade (C2/CBAU) intercept engagement using a GBI launched from Vandenberg Air Force Base, California against an Intercontinental Ballistic Missile (ICBM) target with associated objects, launched from Reagan Test Site (RTS) to support meeting the mandated objective of fielding 44 operational GBIs by 2017 --Collected Critical Engagement Conditions (CEC) / Empirical Measurement Events (EME) data that validates Models and Simulations (M&S) -Initiated planning for Flight Test Ground-based Midcourse Defense-11 (FTG-11), a 3-stage CE-II and 3-stage CE-I Salvo intercept using GBIs launched from Vandenberg Air Force Base, California against an ICBM target with associated objects, launched from Reagan Test Site (RTS) to test operational realism of the GMD salvo capability</p> <p>FY 2017 Plans: -Conduct Flight Test Ground-based Midcourse Defense-15 (FTG-15), a 3-stage C2/CBAU intercept engagement using a GBI launched from Vandenberg Air Force Base, California against an ICBM target with associated objects, launched from Reagan Test Site (RTS) --Collect Critical Engagement Conditions (CEC) / Empirical Measurement Events (EME) data that validates Models and Simulations (M&S) -Continue planning for Flight Test Ground-based Midcourse Defense-11 (FTG-11), a 3-stage CE-II Block I and 3-stage CE-II Salvo intercept using GBIs launched from Vandenberg Air Force Base, California against a target with associated objects, launched from Reagan Test Site (RTS)</p> <p>FY 2018 Plans: -Increase from FY 2017 to FY 2018 is due to the execution of FTG-11 and initial planning for CTV-03.</p>	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<p>-Conduct Flight Test Ground-based Midcourse Defense-11 (FTG-11), a 3-stage CE-II Block I and 3-stage CE-II Salvo intercept using GBIs launched from Vandenberg Air Force Base, California against an ICBM target with associated objects, launched from Reagan Test Site (RTS) to test operational realism of the GMD salvo capability. Salvo intercept test requires additional resources from previous missions to support multiple interceptors: additional range support for mission execution and safety systems, silo refurbishment of two silos, additional data collectors, and additional post mission analyses</p> <p>-Initiate planning of range and data collection assets for Flight Test Ground-based Midcourse Defense-Controlled Test Vehicle-03 (GM CTV-03), a non-intercept mission with Redesigned Kill Vehicle (RKV) to collect RKV flight environment data using a GBI launched from Vandenberg Air Force Base, California</p>			
<p>Title: Ground Test Execution</p> <p align="right">Articles:</p>	3.924	6.386	4.550
<p>Description: Ground tests demonstrate and validate Warfighter tactics, techniques, and procedures. Ground tests are executed both in the Hardware-in-the-loop (HWIL) lab and in the field. HWIL lab tests integrate and assess Ballistic Missile Defense System (BMDS) system- level performance based on new element capabilities. Ground tests in the field use existing fielded element assets and tactical communication networks, to integrate, assess and demonstrate the element capabilities.</p> <p>FY 2016 Accomplishments:</p> <p>-Completed execution of BMDS Ground Test-06 test campaign to assess BMDS capabilities with integration of additional BMDS assets to include the Ft. Drum, NY In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT), and the Space-Based Infrared System (SBIRS) Increment 2 Change, and demonstrate GMD Fire Control (GFC) 6B3 capabilities using a lab based Hardware-in-the-Loop (HWIL) Configuration during Ground Test Integrated -06 (GTI-06)</p> <p>-Completed execution of BMDS Ground Test Distributed-06 (GTD-06) test campaign to assess BMDS capabilities and the mission functionality of the Ground-based Midcourse Defense (GMD) Fire Control (GFC) version 6B3 BMDS capabilities using fielded assets and long haul communications networks</p> <p>-Supported early integration of BMDS Ground Test-07 (GT-07) in support of reducing risk associated with Command, Control, Battle Management Communications (C2BMC) (Spiral 8.2-1 and BMDS Overhead Persistent Infrared Architecture 5.1) and Ground System 6B3.2</p> <p>-Supported planning of BMDS Ground Test-07 test campaign (GTI-07a) to assess BMDS capabilities and the mission functionality of the GMD Ground Systems version 6B3.2 BMDS capabilities for Future Sensor Utilization and Ground Systems (GS) Technology Refresh</p> <p>FY 2017 Plans:</p> <p>-Continue to support planning and integration of BMDS Ground Test-07 test campaign (GTI-07a / GTD-07a / GTX-07b) to assess BMDS capabilities and the mission functionality of the GMD Ground Systems (GS) software versions 6B3.2 / 7B BMDS capabilities for Future Sensor Utilization and Ground Systems (GS) Technology Refresh</p>	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
<p>-Support execution of GTI-07a and GTD-07a to assess BMDS capabilities and the mission functionality of the GMD GS version 6B3.2 BMDS capabilities for Future Sensor Utilization and GS Technology Refresh</p> <p>-Support planning and integration of GTX-07b to assess BMDS capabilities and the mission functionality of the GMD GS software version 7B BMDS capabilities for Robust Homeland Defense performance</p> <p>FY 2018 Plans:</p> <p>-Decrease from FY 2017 to FY 2018 due to the completion of GT-06 Ground Test Campaign</p> <p>-Support execution of GT-07b Early Integration to assess BMDS capabilities and the mission functionality of the GMD GS version 7B BMDS capabilities for Robust Homeland Defense performance</p> <p>-Support execution of GTI-07b and continue to support planning and integration of GTD-07b Part 2 to assess BMDS capabilities and the mission functionality of the GMD GS version 7B BMDS capabilities for Future Sensor Utilization and GS Technology Refresh</p>				
<p>Title: Program Operations</p> <p align="right">Articles:</p> <p>Description: Program Operations provides for government management of the Ground-based Midcourse Defense (GMD) Test program. Included in this effort is program and business management, program administration, technical and testing oversight, quality / safety / mission assurance, integrated logistics support, and government manpower and infrastructure to test the GMD system and components.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans:</p> <p>-Provide technical and business management support activities, financial management, cost and schedule performance analyses, cost estimation and analyses, configuration management, and integration activities to the Program Director with critical program status and decision quality data</p> <p>-Ensure GMD test program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process</p> <p>FY 2018 Plans:</p> <p>-Provide technical and business management support activities, financial management, cost and schedule performance analyses, cost estimation and analyses, configuration management, and integration activities to the Program Director with critical program status and decision quality data</p>		0.000	13.506	13.047
		-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-Ensure GMD test program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process			
Accomplishments/Planned Programs Subtotals	51.821	53.192	73.453

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0203882C: MD08: <i>GMD O&M</i>	133.705	129.281	137.896	-	137.896	143.027	139.319	142.269	145.188	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing
• 0604874C: <i>Improved Homeland Defense (HLD) Interceptors</i>	282.864	274.148	465.530	-	465.530	496.414	532.984	635.749	627.388	Continuing	Continuing

Remarks

D. Acquisition Strategy

The GMD program will continue to follow testing, development, and evolutionary acquisition through incremental development. The Agency acquisition strategy ensures that the GMD components are upgraded to improve both system performance and interceptor reliability in order to retain the proven GMD contribution to the BMDS. This acquisition approach minimizes the risk of parts availability, provides opportunities for incremental capability improvements, and allows decision makers to make informed trades between cost, schedule, and performance while exploring improved operational and technological capabilities.

GMD awarded a competitive Development and Sustainment Contract (DSC) on December 30, 2011. This contract continues development, fielding, test, systems engineering, integration, and configuration management; equipment manufacturing and upgrade; training, operations and sustainment of the GMD system and associated support facilities. The DSC emphasizes the application of performance-based tenets to provide timely high quality support of the core GMD system while reducing life cycle and long-term ownership costs. GMD's acquisition strategy for transition of the legacy content into the DSC provides uninterrupted field operations; development of both Ground Systems and Interceptor (GBI) products, including manufacturing additional interceptors to support both operations and testing; and the requirement to demonstrate war fighting capability through a rigorous ground and flight test program.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>
--	---	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Resources - Cyber Security - Simulation Center	MIPR	Space and Missile Systems Center (SMDC) : AL	0.000	0.009	Jun 2016	0.000		0.000		-		0.000	0	0.009	0
Resources - Cyber Security - Advanced Research Center Cyber Support	C/IDIQ	COLSA Corp : AL	0.000	4.162	Jun 2016	0.000		0.000		-		0.000	0	4.162	0
Resources - Cyber Security - NSITE/GT Communications	MIPR	Aviation & Missile Research & Development : AL	0.000	0.138	Jun 2016	0.000		0.000		-		0.000	0	0.138	0
Resources - Cyber Win10 Implementation - MDDC Lab Analysis Infrastructure	C/IDIQ	Analytical Services, In. : AL	0.000	1.449	Jun 2016	0.000		0.000		-		0.000	0	1.449	0
Resources - Engineering & Analysis - Industry Support	C/CPAF	Boeing : AL	2.423	1.798	Nov 2015	0.000		0.000		-		0.000	0	4.221	0
Resources - Engineering & Analysis - OGA Support	MIPR	AMRDEC : AL	2.389	1.709	Oct 2015	0.000		0.000		-		0.000	0	4.098	0
Resources - Government Infrastructure Support, Labs, and Communications	MIPR	VAFB : CA/AL/CO	6.662	4.833	Nov 2015	6.420	Nov 2016	9.901	Nov 2017	-		9.901	Continuing	Continuing	Continuing
Resources - Prime Infrastructure Support, Labs, and Communications	C/CPAF	Boeing : AL/AK/AZ/CA/CO/OR/TX/VA	4.713	9.118	Nov 2015	7.776	Nov 2016	8.349	Nov 2017	-		8.349	Continuing	Continuing	Continuing
Flight Test Execution - Planning and Silo Refurbishment	C/CPAF	Boeing : AL/AK/AZ/CA/CO/OR/TX/VA	38.264	12.195	Nov 2015	11.649	Nov 2016	8.180	Nov 2017	-		8.180	Continuing	Continuing	Continuing
Flight Test Execution - Range, Resources, and Engineering	MIPR	VAFB/PMRF : CA/HI	15.624	12.486	Nov 2015	7.455	Nov 2016	29.426	Nov 2017	-		29.426	Continuing	Continuing	Continuing
Ground Test Execution - Ground Test-04 Campaign	C/CPAF	Boeing : AL/AK/AZ/CA/CO/TX/VA	3.355	0.000		0.000		0.000		-		0.000	0	3.355	0

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>
--	---	--

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Ground Test Execution - Ground Test-06 Campaign	C/CPAF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	5.033	3.130	Nov 2015	0.258	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Ground Test Execution - Ground Test-07 Campaign	C/CPAF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	0.794	Nov 2015	6.128	Nov 2016	4.459	Nov 2017	-		4.459	Continuing	Continuing	Continuing
Ground Test Execution - Ground Test-08 Campaign	C/CPAF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	0.000		0.000		0.091	Nov 2017	-		0.091	Continuing	Continuing	Continuing
Subtotal			78.463	51.821		39.686		60.406		-		60.406	-	-	-

Remarks

N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Operations - Contract Support Services	C/CPFF	Various AL/AK/ : CA/ CO/VA	0.000	0.000		7.563	Oct 2016	6.942	Oct 2017	-		6.942	Continuing	Continuing	Continuing
Program Operations - Government Civilian Salaries	MIPR	MDA AL/ : VA	0.000	0.000		5.943	Oct 2016	6.105	Oct 2017	-		6.105	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		13.506		13.047		-		13.047	-	-	-

Remarks

N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		78.463	51.821	53.192	73.453	73.453	-	-	-

Remarks

N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MT08 / <i>Midcourse Test</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GM CTV-02 Plus (GM, Intercept Flight Test)	2	2016	2	2016
GTI-06 Part 2 (BMDS Ground Test)	3	2016	3	2016
GTD-06 Part 2 (BMDS Ground Test)	4	2016	4	2016
FTG-15 (GM, Intercept Flight Test)	3	2017	3	2017
GTI-07a (BMDS Ground Test)	3	2017	4	2017
GTD-07a (BMDS Ground Test)	4	2017	4	2017
GTI-07b (N/P) (BMDS Ground Test)	1	2019	1	2019
FTG-11 (IOT&E) (GM, Intercept Flight Test)	4	2018	4	2018
GTD-07b (N/P) (BMDS Ground Test)	3	2019	4	2019
GM CTV-03 (GM, Non-Intercept Flight Test)	1	2020	1	2020
GTI-08 (N/P)(BMDS Ground Test)	2	2020	3	2020
GTD-08 (N/P) (BMDS Ground Test)	1	2021	1	2021
FTG-17 (IOT&E) (GM, Intercept Flight Test)	1	2021	1	2021
FTX-26 (SN, Target Only Flight Test)	3	2021	3	2021
FTG-18 (GM, Intercept Flight Test)	1	2022	1	2022

Note

Notes: CTV - Controlled Test Vehicle; GTI - Ground Test Integrated; GTD - Ground Test Distributed; GTX - Ground Test Exercise; GDEx - Global Defender Exercise; FTG - Flight Test Ground-Based Interceptor; FTO - Flight Test Operational; FTX - Flight Test Exercise

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program Wide Support</i>	-	2.798	3.289	3.304	-	3.304	3.567	3.239	3.757	3.785	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Beginning FY 2016, Program Wide Support (PWS) was proportionately allocated to Ballistic Missile Defense Midcourse Defense Segment Test. In FY 2017 and FY 2018, PWS reflects proportional changes as a result of budget changes to the Missile Defense Midcourse Defense Segment Test.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
---	---------	---------	---------

Title: Program Wide Support	2.798	3.289	3.304
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: - Beginning in FY 2016, Program Wide Support was redistributed across RDT&E Program Elements with a proportional allocation to Ballistic Missile Defense Midcourse Defense Segment Test			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	2.798	3.289	3.304

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations User Services	Reqn	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.000		0.870	Aug 2018	-		0.870	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	Various : MDA Multi: AL, CO, CA	0.000	2.798		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPRs)	MIPR	Various : Multi: AL, VA	0.000	0.000		0.416	Aug 2017	0.016	Aug 2018	-		0.016	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	0.000	0.000		2.825	Aug 2017	2.103	Aug 2018	-		2.103	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support, International, and Materiel and Readiness (MIPRs)	MIPR	Naval Surface Warfare Center : VA, AL	0.000	0.000		0.000		0.249	Aug 2018	-		0.249	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, VA	0.000	0.000		0.048	Jun 2017	0.066	Jun 2018	-		0.066	Continuing	Continuing	Continuing
Subtotal			0.000	2.798		3.289		3.304		-		3.304	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	2.798	3.289	3.304	-	3.304	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / <i>Ballistic Missile Defense Midcourse Defense Segment Test</i>	Project (Number/Name) MD40 / <i>Program Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2022

UNCLASSIFIED

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	71.513	6.500	-	6.500	3.500	229.524	209.830	265.898	0	786.765
MD85: <i>Multi Object Kill Vehicle</i>	-	0.000	68.201	6.500	-	6.500	3.500	225.755	205.048	261.062	0	770.066
MD40: <i>Program-Wide Support</i>	-	0.000	3.312	0.000	-	0.000	0.000	3.769	4.782	4.836	0	16.699

Program MDAP/MAIS Code: 362

Note

In FY 2018, funding for Multi Object Kill Vehicle (MOKV) Development is requested in the Multi Object Kill Vehicle Program Element 0604894C and the MOKV Risk Reduction is requested in the Common Kill Vehicle Technology Program Element 0603294C.

A. Mission Description and Budget Item Justification

The Multi-Object Kill Vehicle (MOKV) program will enhance Ground-Based Midcourse Defense (GMD) Interceptor performance to enable the Warfighter to counter more numerous and complex threats to the Homeland by enabling engagement of multiple objects from a single interceptor. The Missile Defense Agency (MDA) is developing the concepts for a MOKV based on a modular, open systems architecture designed to common interfaces and standards, making upgrades easier and broadening MDA's vendor and supplier base.

The MOKV will rely on a BMDS architecture that balances performance across the Sensors, Command, Control, Battle Management and Communications (C2BMC), and GMD elements. Analyses show that having multiple kill vehicles on each interceptor can dramatically improve the performance of the system, significantly reduce the burden on interceptor inventory, and reduce cost to defend the Homeland.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	71.513	34.884	-	34.884
Current President's Budget	0.000	71.513	6.500	-	6.500
Total Adjustments	0.000	0.000	-28.384	-	-28.384
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	-28.384	-	-28.384

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>
---	--

Change Summary Explanation

The decrease in FY2018 from PB17 to PB18 is due to the transfer of MOKV technology risk reduction to the Common Kill Vehicle Technology program element 0603294C to align with the FY 2017 Congressional Appropriation Conference Report.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>				Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD85: <i>Multi Object Kill Vehicle</i>	-	0.000	68.201	6.500	-	6.500	3.500	225.755	205.048	261.062	0	770.066
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The Ground-based Midcourse Defense (GMD) element of the Ballistic Missile Defense System (BMDS) provides combatant commanders with a continuously available (24 hours a day, 365 days a year) capability to defend the United States Homeland against Intercontinental Ballistic Missile (ICBM) attacks. In order to address the evolving and expanding threat of ballistic missile attacks on the Homeland, MDA is developing a more capable ground-based interceptor with a Multi-Object Kill Vehicle (MOKV) that will be able to defeat complex future threats.

MDA will develop an MOKV that is:

- Effective, with the weapon payload able to use on-board and off-board data to acquire, track, select, engage and negate the threats
- Capable, enabling protection of the defended area with sufficient battlespace to meet the warfighter needs
- Enduring, available and reliable over a long service life
- Resilient, with graceful degradation, and survivable in natural and man-made wartime environments
- Compatible and fully integrated as a component of the BMDS, optimized to perform within the baseline BMDS architecture
- Modular, supporting open architecture and standards to enable efficient upgrades and sustainment
- Evolvable to future architecture expansion and modifications

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Multi-Object Kill Vehicle	0.000	68.201	6.500
Articles:	-	-	-
Description: Development of the Multi Object Kill Vehicle (MOKV) Development Acquisition Strategy. In FY 2018 funding for MOKV Development is requested in the Multi Object Kill Vehicle program element 0604894C and the MOKV Risk Reduction is requested in the Common Kill Vehicle Technology program element 0603294C.			
The MOKV concept replaces a unitary kill vehicle (KV) on current GBIs with a payload containing multiple, smaller kill vehicles (KVs). The MOKV concept also allows for a potentially substantial reduction of the GBI inventory required to protect the homeland, as multiple GBIs with a unitary KV will no longer be required to address a target complex with multiple threats.			
FY 2016 Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>
--	--	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
N/A			
<i>FY 2017 Plans:</i> see above			
<i>FY 2018 Plans:</i> Decrease from FY 2017 to FY 2018 due to transfer of risk reduction funds to the Common Kill Vehicle Technology program element 0603294C.			
<ul style="list-style-type: none"> - Conduct market research to shape acquisition strategy - Develop an acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV - Establish initial modeling and simulation capability to support MOKV project decisions - Initiate contract requirements development 			
Accomplishments/Planned Programs Subtotals	0.000	68.201	6.500

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy will support transition of Multi Object Kill Vehicle (MOKV) from risk reduction activities into a full development effort as an integrated part of the Ground-based Midcourse Defense Element. The MOKV project will follow a pre-planned product improvement strategy and use modular open architectures to allow MDA to incorporate advanced technologies into the design once the technologies are sufficiently mature. MDA will use proven analysis and testing techniques to independently verify contractor designs against the defined system performance specifications and standards prior to production.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle	Project (Number/Name) MD85 / Multi Object Kill Vehicle
--	---	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Multi-Object Kill Vehicle - Inertial Measurement Unit Development	C/CPFF	Kearfott : NJ	0.000	0.000		3.700	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Technology Risk Reduction	C/CPFF	TBD : TBD	0.000	0.000		44.463	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		48.163		0.000		-		0.000	-	-	-

Remarks
N/A

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Multi-Object Kill Vehicle - Contract Support Services	C/CPFF	Various : AL/AK/CA/CO/VA	0.000	0.000		0.909	Oct 2016	2.800	Nov 2017	-		2.800	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Contract Support Services DV	C/CPFF	Various : AL	0.000	0.000		0.860	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - FFRDC Support Services	MIPR	Various : Various	0.000	0.000		0.000		0.750	Nov 2017	-		0.750	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Government Civilian Salaries GM	Allot	MDA : AL/VA	0.000	0.000		1.364	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Government Civilian Salaries and Travel	Allot	MDA : AL	0.000	0.000		4.866	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Inertial Measurement Unit Radiation Support	MIPR	TBD : TBD	0.000	0.000		0.300	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Inertial Measurement Unit Support	MIPR	Army Aviation and Missile Research Development and	0.000	0.000		0.150	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle	Project (Number/Name) MD85 / Multi Object Kill Vehicle
--	---	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Engineering Center : AL													
Multi-Object Kill Vehicle - MOKV Engagement Management Algorithms	MIPR	MIT/LL : MA	0.000	0.000		0.400	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Engineering Support	C/CPFF	Johns Hopkins University / Applied Research Lab : MD	0.000	0.000		3.476	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Engineering/Engagement Management Support	MIPR	Army Aviation and Missile Research Development and Engineering Center : AL	0.000	0.000		2.920	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV OGA Support	MIPR	NSWC Carderock : MD	0.000	0.000		0.194	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Seeker Engineering Support	C/CPFF	Utah State University/Space Dynamics Lab : UT	0.000	0.000		0.390	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Other Government Agencies	MIPR	Various : Various	0.000	0.000		0.000		1.800	Nov 2017	-		1.800	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Technical Direction Agent	MIPR	Various : AL/CA/GA/MA/MD/NM/UT/VA	0.000	0.000		2.691	Oct 2016	1.150	Nov 2017	-		1.150	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Various	TBD	Various : Various	0.000	0.000		1.518	Oct 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		20.038		6.500		-		6.500	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>
--	--	---

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	68.201	6.500	-	6.500	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>
--	--	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●				Complete Activity ◆							
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○				Planned Activity ◇							
	FY 2016		FY 2017		FY 2018				FY 2019				FY 2020		FY 2021		FY 2022	
MOKV Development Acquisition Strategy					◇	◇	◇	◇	◇	◇	◇	◇						
MOKV Development													◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>
--	--	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MOKV Development Acquisition Strategy	1	2018	4	2019
MOKV Development	1	2020	4	2023

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle				Project (Number/Name) MD40 / Program-Wide Support			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: Program-Wide Support	-	0.000	3.312	0.000	-	0.000	0.000	3.769	4.782	4.836	0	16.699
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning FY 2017, Program Wide Support (PWS) was proportionately allocated to Multi Object Kill Vehicle.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs, including Government Civilians and Contract Support Services , in support of MDA functions and activities across the entire BMDS. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	0.000	3.312	0.000
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: - This is a new Program Element beginning FY 2017. 0604894C Multi-Object Kill Vehicle was created in FY 2017 transitioning from 0603294C Common Kill Vehicle. Program Wide Support was redistributed across RDT&E Program Elements with a proportional allocation to Multi-Object Kill Vehicle			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	0.000	3.312	0.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency Date: May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.066	Jul 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Various : Multi: AK, AL, CA, CO, HI, VA	0.000	0.000		2.327	Aug 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Various : Multi: AK, AL, CA, CO, VA	0.000	0.000		0.919	Jul 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		3.312		0.000		-		0.000	-	-	-

Remarks

N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	3.312	0.000	-	0.000	-	-	-

Remarks

N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date: May 2017**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆																
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 10%;">FY 2016</th> <th style="width: 10%;">FY 2017</th> <th style="width: 10%;">FY 2018</th> <th style="width: 10%;">FY 2019</th> <th style="width: 10%;">FY 2020</th> <th style="width: 10%;">FY 2021</th> <th style="width: 10%;">FY 2022</th> </tr> </thead> <tbody> <tr> <td>MD40 Program-Wide Support</td> <td></td> <td>◇◇◇◇◇</td> <td>◇◇◇◇◇</td> <td>◇◇◇◇◇</td> <td>◇◇◇◇◇</td> <td>◇◇◇◇◇</td> <td>◇◇◇◇◇</td> </tr> </tbody> </table>						FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	MD40 Program-Wide Support		◇◇◇◇◇	◇◇◇◇◇	◇◇◇◇◇	◇◇◇◇◇	◇◇◇◇◇	◇◇◇◇◇
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022													
MD40 Program-Wide Support		◇◇◇◇◇	◇◇◇◇◇	◇◇◇◇◇	◇◇◇◇◇	◇◇◇◇◇	◇◇◇◇◇													

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2017	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0305103C / Cyber Security Initiative
---	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	1.856	0.941	0.969	0.986	-	0.986	0.997	1.031	1.051	1.073	Continuing	Continuing
MDCS: Cyber Security Initiative	1.856	0.941	0.969	0.986	-	0.986	0.997	1.031	1.051	1.073	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The MDA Counterintelligence (CI) Division conducts CI in Cyberspace activities pursuant to DoD Directive DoDD 5240.02 (Counterintelligence) and DoD Instruction S-5240.23 (CI Activities in Cyberspace) to identify, disrupt, neutralize, penetrate, and exploit foreign intelligence services and international terrorist organizations, hereafter referred to as foreign entities, to act in observable or exploitable ways. To this end, the MDA CI Division conducts activities to detect and neutralize foreign entity-directed malicious and insider threat activities targeting MDA administrative and Ballistic Missile Defense fire control networks and mobile devices.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.963	0.969	0.986	-	0.986
Current President's Budget	0.941	0.969	0.986	-	0.986
Total Adjustments	-0.022	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.022	0.000			
• Other Adjustment	0.000	0.000	0.000	-	0.000

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0305103C / <i>Cyber Security Initiative</i>				Project (Number/Name) MDCS / <i>Cyber Security Initiative</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MDCS: <i>Cyber Security Initiative</i>	1.856	0.941	0.969	0.986	-	0.986	0.997	1.031	1.051	1.073	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The DoD Counterintelligence in Cyberspace (CIC) mission initiative is externally funded and falls under the functional and fiscal management of the Director, Defense Intelligence Agency. The MDA Counterintelligence (CI) Division conducts defensive CIC activities pursuant to DoD Directive DoDD 5240.02 (Counterintelligence), DoD Instruction S-5240.23 (CI Activities in Cyberspace) and DoD Instruction 5240.26 (Countering Espionage, International Terrorism, and the CI Insider Threat), and an MDA Annex within an annual DIA-approved Implementation Plan.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: DoD CI in Cyberspace Initiative	0.941	0.969	0.986
Articles:	-	-	-
<p>Description: This activity detects, identifies and neutralizes malicious activities directed by foreign entities that target MDA cyber assets. The following actions are required on a continuing basis to accomplish the DoD CI in Cyberspace Initiative:</p> <ul style="list-style-type: none"> -- Collaborate with the MDA Computer Emergency Response Team (CERT) to detect and neutralize potential foreign entity directed malicious and insider threat activities targeting MDA administrative and fire control networks, and mobility devices. -- Conduct CI Preliminary Inquiries into potential foreign entity directed malicious or insider threat activities and refers suspected incidents or events to the FBI or military department CI organizations for further investigation. -- Conduct CI forensics analysis of MDA computer network activity logs to identify potential indicators of foreign entity directed malicious, insider threat or computer network attack/exploitation activities targeting MDA information. -- Coordinate with national and DoD level intelligence, CI and law enforcement agencies to identify foreign entity cyber actor intrusion sets and the tactics, techniques and procedures used to target MDA and its Cleared Defense Contractor computer networks. -- Coordinate with MDA cleared defense contractors that have been compromised by foreign intelligence entities to capture and triage exfiltrated MDA related data, allowing BMDS engineering teams to perform proper damage assessments. -- Provide required initial and periodic training to ensure the MDA workforce is kept apprised of foreign entity threats to DoD personnel, facilities, information, activities, and information technology systems. -- Protect MDA SCIF/SAP areas from cellular/wireless device monitoring. -- Provide support to the MDA Insider Threat program. 			
FY 2016 Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0305103C / <i>Cyber Security Initiative</i>	Project (Number/Name) MDCS / <i>Cyber Security Initiative</i>
--	--	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Conducted activities listed in Description section - SEE ABOVE.			
<i>FY 2017 Plans:</i> - Conduct activities listed in Description section - SEE ABOVE.			
<i>FY 2018 Plans:</i> - Conduct activities listed in Description section - SEE ABOVE.			
Accomplishments/Planned Programs Subtotals	0.941	0.969	0.986

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603890C: <i>BMD</i> <i>Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project leverages expertise in the intelligence community, counterintelligence community, and information assurance community, including the Military Services, Federally Funded Research and Development Centers (FFRDCs), University affiliated Research Centers (UARCs), and industry.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0305103C / <i>Cyber Security Initiative</i>	Project (Number/Name) MDCS / <i>Cyber Security Initiative</i>
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DoD CI in Cyberspace Initiative - CI in Cyberspace	Allot	MDA : VA	0.166	0.162	Nov 2015	0.164	Oct 2016	0.166	Oct 2017	-		0.166	Continuing	Continuing	Continuing
DoD CI in Cyberspace Initiative - Counterintelligence	C/CPFF	ManTech : VA, AL	1.471	0.304	Nov 2015	0.307	Nov 2016	0.720	Nov 2017	-		0.720	Continuing	Continuing	Continuing
DoD CI in Cyberspace Initiative - Technical Surveillance & Countermeasures	MIPR	USA-TAO : Ft. Detrick, MD	0.219	0.475	Nov 2015	0.498	Nov 2016	0.100	Nov 2017	-		0.100	Continuing	Continuing	Continuing
Subtotal			1.856	0.941		0.969		0.986		-		0.986	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.856	0.941	0.969	0.986	-	0.986	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0305103C / <i>Cyber Security Initiative</i>	Project (Number/Name) MDCS / <i>Cyber Security Initiative</i>
--	--	---

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MDCS Cyber Security Initiative	1	2016	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	34.907	-	34.907	39.453	37.583	36.893	37.726	Continuing	Continuing
MD12: <i>Space Tracking and Surveillance System (STSS)</i>	-	0.000	0.000	32.015	-	32.015	32.597	34.256	34.780	35.489	Continuing	Continuing
MC12: <i>Cyber Operations</i>	-	0.000	0.000	1.336	-	1.336	4.968	1.592	0.343	0.443	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	-	0.000	0.000	1.556	-	1.556	1.888	1.735	1.770	1.794	0	8.743

Program MDAP/MAIS Code: 362

Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

A. Mission Description and Budget Item Justification

The two Space Tracking and Surveillance System (STSS) satellites launched in 2009 provide an on-orbit capability to validate remote sensor fire control integration to inform design and operation of future Missile Defense Agency (MDA) space-layer capabilities. MDA uses STSS data to characterize contribution of space data into the BMDS and to provide sensor measurements and background data supporting trade studies and analyses for future MDA space-layer options for both Homeland and Regional Defense.

STSS continues to provide risk reduction for future MDA space capabilities, models, algorithms, interface definitions, communications architectures, and performance across threat object acquisition, tracking, complex target signatures, discrimination and multi-mission support. STSS also informs the Ballistic Missile Defense System (BMDS) Concept of Operations, timelines and performance requirements for remote space sensor cuing for ballistic missile engagements, expanding battle space for weapon systems such as Aegis BMD.

The STSS program demonstrates the functions and interfaces required for space data delivery to the BMDS, validating the data quality necessary for interceptors to launch and/or engage on STSS sensor data. The two STSS satellites are operated from the ground station processing center at the Missile Defense Space Center (MDSC). The STSS satellites demonstrate MDA space-layer capabilities and reduce risk for future systems by viewing high-value Targets of Opportunity and participating in BMDS flight tests.

The MDSC provides MDA's only centralized collaboration and integration environment that leverages existing Overhead Persistent Infrared (OPIR) enterprise integration in support of BMDS research and development test, and sensor operations. The MDSC capabilities and infrastructure support flight tests, operational concept and prototype development, technology demonstrations, experiments, and algorithm development within a multi-security, collaborative environment to integrate and exploit

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>
---	--

national space asset data. The MDSC also conducts studies and experiments with MDA assets such as the Spacebased Kill Assessment (SKA), and STSS, as well as other agencies' assets.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	34.907	-	34.907
Total Adjustments	0.000	0.000	34.907	-	34.907
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	34.907	-	34.907

Change Summary Explanation

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>				Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD12: <i>Space Tracking and Surveillance System (STSS)</i>	-	0.000	0.000	32.015	-	32.015	32.597	34.256	34.780	35.489	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

A. Mission Description and Budget Item Justification

Two Space Tracking and Surveillance System (STSS) satellites provide a low earth orbit sensor capability with visible and infrared sensors for integrated testing with other Ballistic Missile Defense System (BMDS) elements. STSS demonstrates space-based capabilities including persistent tracking and integrated BMDS discrimination improvements. These two satellites provide valuable risk reduction for acquisition, tracking, complex scenes, and discrimination functionality to include stereo data fusion, cueing radars over the horizon and over-the-horizon fire control.

The on-orbit sensors collect invaluable background, scene and target signatures to support future MDA space-layer and other weapon sensor development trade studies. STSS activities provide information for integration of space-based missile tracking (midcourse phase); remote sensor and weapons cueing via the Command and Control, Battle Management and Communications (C2BMC); features and discrimination; and hit/impact point assessments. STSS enables early capability assessment to address the Warfighter's need for highly available early missile tracking from space, providing an operationally suitable means of global persistent surveillance and engagement. Capabilities being assessed for future MDA space-layer capabilities include detecting and acquiring ballistic missiles; tracking ballistic missiles and their deployed objects; performing autonomous acquisition-to-track handover within a satellite; performing tracking handover to a satellite from a ground cue; performing uplink and downlink of mission, health, and status data both directly and via crosslink between two satellites; reporting ballistic missile and intercept event to close the fire-control loop; filtering reports to C2BMC; and providing near real-time object data to external users. STSS support to other mission areas improves definition for future Enterprise system approaches.

The Missile Defense Space Center (MDSC) provides capabilities and infrastructure to support space operations, integration and testing with the BMDS. It provides a multi-level security environment for sensor data management and integration across space and terrestrial sensor data activities. MDSC experiments leverage DoD and national security space capabilities. MDSC activities support analyses, demonstration and integration of space sensor capabilities into developmental and operational MDA elements. MDSC enables the development of advanced technology and algorithms including fusion of multiple sensor types (radar, overhead persistent infrared, electro-optical and other emerging sensor technologies). It also supports mission integration of space-based missile tracking, sensor and weapons cueing via C2BMC, features and discrimination, kill and impact point assessments into the BMDS and other non-MDA mission areas, including Space Situational Awareness, technical intelligence, and battle space characterization. This effort is a continuation of work previously performed in program element 0603895C that supported the STSS program.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>

Lessons learned and data gathered from the STSS demonstration satellites program provide valuable information for future MDA space-layer modeling and simulation activities in assessing the capability provided by Overhead Persistent Infrared sensors.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Demonstration Satellites	0.000	0.000	32.015
Articles:	-	-	-
<p>Description: The Space Tracking and Surveillance System (STSS) demonstration satellites collect and deliver critical space and missile characterization data used to design and inform the BMDS and space-layer future capabilities. The Missile Defense Space Center (MDSC) facilities and activities are required for safe STSS satellite operations and sustainment</p> <p>STSS activities include:</p> <ul style="list-style-type: none"> - Perform risk reduction for future MDA tracking and surveillance initiatives and Overhead Persistent Infra-red (OPIR) Enterprise integration and demonstrations across OPIR cueing, Joint Tasking Operations, and data utility - Collect data to support joint OPIR mission utility assessments across Space Situational Awareness, Battle Space Awareness, and Technical Intelligence missions to include integration, analyses, and studies to confirm data sharing capabilities - Participate in Integrated Master Test Plan events - Conduct satellite testing to demonstrate critical space capabilities, including: <ul style="list-style-type: none"> -- Ability to support BMDS integrated discrimination efforts -- Ability to support Hit/Kill assessment from space -- Ability to cue BMDS sensors from space -- Ability to provide precision cue to BMDS sensors - Perform satellite functionality testing and calibration as part of the satellite operations - Conduct missile tracking experiments as identified in the test specific sections - Provide Air Force Space Command Space Situational Awareness support <p>MDSC efforts related to STSS include:</p> <ul style="list-style-type: none"> - Analyze space radiation environment and its influence on MDA space system performance - Analyze space based sensor data from STSS and OPIR observations, both individually and combined, to identify phenomenology and techniques to aid future tracking and discrimination architectures - Provide data for concept studies and analyses for alternative sensor payload configurations - Sustain MDSC resources for all participant activities, including data, voice, and/or video communications, and support MDA Cyber Security directives - Document requirements and perform tracking, design, implementation, and verification necessary for the MDSC facility - Implement emerging cyber security requirements 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<i>FY 2016 Accomplishments:</i> N/A			
<i>FY 2017 Plans:</i> In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C. Prior year accomplishments can be found in PE 0603893C			
<i>FY 2018 Plans:</i> - Conduct STSS and MDSC activities listed in Description section (above)			
Accomplishments/Planned Programs Subtotals	0.000	0.000	32.015

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	406.326	408.594	449.442	-	449.442	466.760	540.409	629.864	501.915	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	--	---

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 1206895C: <i>Ballistic Missile Defense System Space Programs</i>	0.000	0.000	16.994	-	16.994	13.348	14.395	17.278	17.726	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Space Tracking and Surveillance System (STSS) demonstration satellites program follows MDAs capability-based acquisition strategy that emphasizes testing, incremental development, and evolutionary acquisition. The STSS effort utilizes a single prime contractor, Northrop Grumman Aerospace Systems (NGAS), formerly known as Northrop Grumman Space Technology (NGST), with the subcontractor Raytheon providing the sensor payload. This contract implements MDA's capability-based acquisition strategy by using existing satellite hardware as a low risk opportunity, building upon the lessons learned from previous development efforts, and establishing a series of planned enhancements to bring added capability to the BMDS.

MDSC efforts will be acquired on the Integrated Research and Development for Enterprise Solutions (IRES) contract vehicle. This contract is responsible for integrating Research, Development, Test and Evaluation, operations support, resource and infrastructure management for the MDSC. Through various uses of incentives upon the requirement objectives, the contractor provides customer support while striving to achieve efficiencies through approaches that meet or exceed customer requirements.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstration Satellites - Demonstration Satellites - Capability Based R&D	SS/CPAF	NGAS : Redondo Beach, CA, Schriever AFB, CO	0.000	0.000		0.000		20.066	Nov 2017	-		20.066	Continuing	Continuing	Continuing
Demonstration Satellites - Demonstration Satellites - STSS Support to Missile Defense Space Center (MDSC)	C/TBD	TBD : Schriever AFB, CO	0.000	0.000		0.000		3.893	Nov 2017	-		3.893	Continuing	Continuing	Continuing
Demonstration Satellites - Demonstration Satellites - Systems Engineering	FFRDC	Aerospace : Los Angeles, CA	0.000	0.000		0.000		0.278	Nov 2017	-		0.278	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		24.237		-		24.237	-	-	-

Remarks
All efforts listed above are a continuation of PE 0603893C, MD12

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstration Satellites - Demonstration Satellites - Contract Support Services (CSS)	C/Various	MDA : AL, CO	0.000	0.000		0.000		3.197	Nov 2017	-		3.197	Continuing	Continuing	Continuing
Demonstration Satellites - Demonstration Satellites - IT User Services	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	0.000		0.000		0.618	Dec 2017	-		0.618	Continuing	Continuing	Continuing
Demonstration Satellites - Demonstration Satellites - MDA Civilian	Allot	MDA : Schriever AFB, CO	0.000	0.000		0.000		3.072	Oct 2017	-		3.072	Continuing	Continuing	Continuing
Demonstration Satellites - Demonstration Satellites - Other Government Agency (OGA) Civilian	MIPR	SMC : Schriever AFB, CO	0.000	0.000		0.000		0.162	Nov 2017	-		0.162	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstration Satellites - Demonstration Satellites - Program Mission Support	Various	Various : Various	0.000	0.000		0.000		0.310	Nov 2017	-		0.310	Continuing	Continuing	Continuing
Demonstration Satellites - Demonstration Satellites - UARC	C/CPFF	Utah University, Space Dynamics Laboratory : AL, AK, CA, CO, HI, MA, UT, VA	0.000	0.000		0.000		0.419	Nov 2017	-		0.419	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		7.778		-		7.778	-	-	-

Remarks
All efforts listed above are a continuation of PE 0603893C, MD12

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	32.015	-	32.015	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	--	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆	
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇	
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022			
FTM-29 (AEGIS 5.1, Intercept Flight Test)			△							
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2018			△							
STSS Demonstration Satellites On-Orbit Operations - 1Q2018-4Q2018			◇	◇	◇	◇				
MIS Operations - 1Q2018-4Q2018			◇	◇	◇	◇				
Mission Planning, Tasking and Analysis - 1Q2018-4Q2018			◇	◇	◇	◇				
MDSC TIL Operations - 1Q2018-4Q2018			◇	◇	◇	◇				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2018			△							
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2018				△						
FTM-33 (AEGIS SBT, Intercept Flight Test)							△			
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2018				△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2019				△						
FTG-11 (IOT&E) (GM, Intercept Flight Test)				△						
STSS Demonstration Satellites On-Orbit Operations - 1Q2019-4Q2019				◇	◇	◇	◇			
FT0-03 E1 (OTA, Intercept Flight Test)			△							
MIS Operations - 1Q2019-4Q2019				◇	◇	◇	◇			
Mission Planning, Tasking and Analysis - 1Q2019-4Q2019				◇	◇	◇	◇			
FTM-31 (AEGIS SBT, Intercept Flight Test)				△						
MDSC TIL Operations - 1Q2019-4Q2019				◇	◇	◇	◇			
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2019				△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2019				△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2019					△					
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2020						△				
STSS Demonstration Satellites On-Orbit Operations - 1Q2020-4Q2020					◇	◇	◇	◇		
FT0-03 E2 (OTA, Intercept Flight Test)							△			

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017										
Appropriation/Budget Activity			R-1 Program Element (Number/Name)			Project (Number/Name)										
0400 / 4			PE 1206893C / Space Tracking and Surveillance System (STSS)			MD12 / Space Tracking and Surveillance System (STSS)										
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●			Complete Activity ◆										
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○			Planned Activity ◇										
			FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
MIS Operations - 1Q2020-4Q2020											◇	◇	◇	◇		
Mission Planning, Tasking and Analysis - 1Q2020-4Q2020											◇	◇	◇	◇		
FTM-32 (AEGIS SBT, Intercept Flight Test)										△						
MDSC TIL Operations - 1Q2020-4Q2020											◇	◇	◇	◇		
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2020											△					
FTX-23 (AEGIS 5.1, Target Only Flight Test)										△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2020												△				
FEV-02 (FTM-DST 2) (AEGIS 5.0, Intercept Flight Test)										△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2020												△				
FTX-27 (SN, Target Only Flight Test)										△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2021												△				
STSS Demonstration Satellites On-Orbit Operations - 1Q2021-4Q2021												◇	◇	◇	◇	
GM CTV-03 (GM, Non-Intercept Flight Test)											△					
MIS Operations - 1Q2021-4Q2021												◇	◇	◇	◇	
Mission Planning, Tasking and Analysis - 1Q2021-4Q2021												◇	◇	◇	◇	
MDSC TIL Operations - 1Q2021-4Q2021												◇	◇	◇	◇	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2021													△			
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2021														△		
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2021															△	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2022																△
FTT-19 (TH, Intercept Flight Test)												△				
STSS Demonstration Satellites On-Orbit Operations - 1Q2022-4Q2022																◇
MIS Operations - 1Q2022-4Q2022																◇
FTM-30 (AEGIS 5.1, Intercept Flight Test)												△				◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FTM-29 (AEGIS 5.1, Intercept Flight Test)	1	2018	1	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2018	1	2018	1	2018
STSS Demonstration Satellites On-Orbit Operations - 1Q2018-4Q2018	1	2018	4	2018
MIS Operations - 1Q2018-4Q2018	1	2018	4	2018
Mission Planning, Tasking and Analysis - 1Q2018-4Q2018	1	2018	4	2018
MDSC TIL Operations - 1Q2018-4Q2018	1	2018	4	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2018	2	2018	2	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2018	3	2018	3	2018
FTM-33 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2018	4	2018	4	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2019	1	2019	1	2019
FTG-11 (IOT&E) (GM, Intercept Flight Test)	4	2018	4	2018
STSS Demonstration Satellites On-Orbit Operations - 1Q2019-4Q2019	1	2019	4	2019
FT0-03 E1 (OTA, Intercept Flight Test)	3	2018	3	2018
MIS Operations - 1Q2019-4Q2019	1	2019	4	2019
Mission Planning, Tasking and Analysis - 1Q2019-4Q2019	1	2019	4	2019
FTM-31 (AEGIS SBT, Intercept Flight Test)	1	2019	1	2019
MDSC TIL Operations - 1Q2019-4Q2019	1	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2019	2	2019	2	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2019	3	2019	3	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2019	4	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2020	1	2020	1	2020

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
STSS Demonstration Satellites On-Orbit Operations - 1Q2020-4Q2020	1	2020	4	2020
FT0-03 E2 (OTA, Intercept Flight Test)	2	2019	2	2019
MIS Operations - 1Q2020-4Q2020	1	2020	4	2020
Mission Planning, Tasking and Analysis - 1Q2020-4Q2020	1	2020	4	2020
FTM-32 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
MDSC TIL Operations - 1Q2020-4Q2020	1	2020	4	2020
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2020	2	2020	2	2020
FTX-23 (AEGIS 5.1, Target Only Flight Test)	4	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2020	3	2020	3	2020
FEV-02 (FTM-DST 2) (AEGIS 5.0, Intercept Flight Test)	4	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2020	4	2020	4	2020
FTX-27 (SN, Target Only Flight Test)	4	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2021	1	2021	1	2021
STSS Demonstration Satellites On-Orbit Operations - 1Q2021-4Q2021	1	2021	4	2021
GM CTV-03 (GM, Non-Intercept Flight Test)	1	2020	1	2020
MIS Operations - 1Q2021-4Q2021	1	2021	4	2021
Mission Planning, Tasking and Analysis - 1Q2021-4Q2021	1	2021	4	2021
MDSC TIL Operations - 1Q2021-4Q2021	1	2021	4	2021
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2021	2	2021	2	2021
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2021	3	2021	3	2021
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2021	4	2021	4	2021
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2022	1	2022	1	2022
FTT-19 (TH, Intercept Flight Test)	3	2020	3	2020
STSS Demonstration Satellites On-Orbit Operations - 1Q2022-4Q2022	1	2022	4	2022
MIS Operations - 1Q2022-4Q2022	1	2022	4	2022

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
FTM-30 (AEGIS 5. 1, Intercept Flight Test)	4	2020	4	2020
Mission Planning, Tasking and Analysis - 1Q2022-4Q2022	1	2022	4	2022
MDSC TIL Operations - 1Q2022-4Q2022	1	2022	4	2022
FTG-17 (IOT&E) (GM, Intercept Flight Test)	1	2021	1	2021
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2022	2	2022	2	2022
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2022	3	2022	3	2022
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2022	4	2022	4	2022
FTX-26 (SN, Target Only Flight Test)	3	2021	3	2021
FTM-38 (AEGIS 5.0, Intercept Flight Test)	3	2021	3	2021
FTT-21 (TH, Intercept Flight Test)	4	2021	4	2021
FTG-18 (GM, Intercept Flight Test)	1	2022	1	2022
FTM-35 (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
FTM-37 (IOT&E) (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
FTX-28 E1 (TH, Target Only Flight Test)	3	2022	3	2022
FTX-28 E2 (TH, Target Only Flight Test)	3	2022	3	2022
FTX-28 E3 (TH, Target Only Flight Test)	3	2022	3	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MC12 / <i>Cyber Operations</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC12: <i>Cyber Operations</i>	-	0.000	0.000	1.336	-	1.336	4.968	1.592	0.343	0.443	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Space Tracking and Surveillance System (STSS) Cyber Operations sustain the Missile Defense Agency (MDA) Risk Management Framework (RMF) and Security Controls Assessments (SCA)/Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/ Information System Security Manager (PM/ISSM) Plans of Action and Milestones (POA&Ms) for MDA STSS mission systems. Activities in this Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Network/System Certification and Accreditation (C&A)	0.000	0.000	1.336
Articles:	-	-	-
<p>Description: This activity maintains the Assessment and Authorization (A&A) and Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and plans of action and milestones (POA&Ms) on all MDA information systems. This activity prepares and submits C&A documentation and accreditation recommendations to the MDA Chief Information Officer (CIO) /Certification Authority and the DAA. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of the MDA mission, test, and administrative systems. Recurring accomplishments include the following: - Monitor and track cybersecurity and mitigations detailed in Information Technology security POA&Ms. - Conduct cybersecurity design, engineering, and architecture planning for STSS information technology systems - Plan and test the cybersecurity controls for STSS and MDSC systems - Conduct Security Controls Assessment (SCA) testing continuous monitoring of C2BMC mission systems and provide POA&Ms to mitigate cybersecurity vulnerabilities.</p>			
<p>FY 2016 Accomplishments: N/A</p>			
<p>FY 2017 Plans: N/A</p>			
<p>FY 2018 Plans:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MC12 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
- Conduct activities listed in Description section (above).			
Accomplishments/Planned Programs Subtotals	0.000	0.000	1.336

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MC12 / <i>Cyber Operations</i>
--	--	--

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network/System Certification and Accreditation (C&A) - Civ Cyber Labor	Allot	MDA : Various	0.000	0.000		0.000		0.165	Oct 2017	-		0.165	Continuing	Continuing	Continuing
Network/System Certification and Accreditation (C&A) - Information Assurance	C/CPAF	NGAS : Schriever AFB, CO/Redondo Beach, CA	0.000	0.000		0.000		1.171	Nov 2017	-		1.171	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		1.336		-		1.336	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	1.336	-	1.336	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MC12 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC12 Cyber Operations	1	2018	4	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	-	0.000	0.000	1.556	-	1.556	1.888	1.735	1.770	1.794	0	8.743
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Beginning in FY 2018, Program Wide Support was proportionately reallocated as a result of the Space Tracking and Surveillance System transfer from 0603893C Program Element.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	0.000	0.000	1.556
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	0.000	0.000	1.556

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.000		0.208	Jul 2018	-		0.208	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPAF	Northrop Grumman : CO	0.000	0.000		0.000		1.348	Jan 2018	-		1.348	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		1.556		-		1.556	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	1.556	-	1.556	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆															
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇															
					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th align="center">FY 2016</th> <th align="center">FY 2017</th> <th align="center">FY 2018</th> <th align="center">FY 2019</th> <th align="center">FY 2020</th> <th align="center">FY 2021</th> <th align="center">FY 2022</th> </tr> <tr> <td></td> <td></td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> <td align="center">◇◇◇◇</td> </tr> </table>	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022			◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇
FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022													
		◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇	◇◇◇◇													
MD40 Program-Wide Support																			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2018	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	16.994	-	16.994	13.348	14.395	17.278	17.726	Continuing	Continuing
MD33: <i>MD Space Exp Center (MDSEC)</i>	-	0.000	0.000	16.233	-	16.233	12.706	13.726	16.444	16.878	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	-	0.000	0.000	0.761	-	0.761	0.642	0.669	0.834	0.848	0	3.754

Program MDAP/MAIS Code: 362

Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603895C is transferred to PE 1206895C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

A. Mission Description and Budget Item Justification

This program element primarily funds the Spacebased Kill Assessment (SKA) project, a Missile Defense Agency (MDA) experiment to demonstrate kill assessment from space. MDA experience with intercept testing on the Aegis BMD program provided solid understanding of the physics of kill assessment.

Several events set the stage for the kill assessment experiment that later became known as SKA:

- Section 237 in the FY 2014 National Defense Authorization Act directed MDA to improve kill assessment for the GMD program with an initial kill assessment capability by December 31, 2019
- An MDA study called the Space Layer Option Study found that disaggregated systems could provide sensor capabilities at lower costs
- A once in a decade opportunity became available when the commercial sector offered hosted payload services at costs far below what MDA could expect if it used traditional DOD space acquisition models

One feature of the SKA acquisition plays a crucial role in the execution of the experiment: schedule discipline. Since MDA cannot impact the schedule of the commercial host, maintaining schedule pace is priority #1 on the program. If SKA payloads are delivered late to the commercial host, they miss their opportunity to be launched into space.

SKA incorporates Government Accountability Office (GAO) recommendations to examine the operational feasibility of disaggregating large satellites (report number GAO-15-7) and to provide data for the business case for shared or dedicated satellite control, including the ground antenna networks (report number GAO-13-315). The SKA experiment will utilize a network of small IR sensors integrated onto commercial host satellites which, while on orbit, will observe missile defense intercepts and deliver a kill assessment declaration to the BMDS. SKA has the opportunity to change the economics of the defense of the American homeland from enemy ballistic missiles.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>
---	--

This program element also funds engineering trade studies and concept evaluations for current and future space based sensors.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	16.994	-	16.994
Total Adjustments	0.000	0.000	16.994	-	16.994
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	16.994	-	16.994

Change Summary Explanation

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603895C is transferred to PE 1206895C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>				Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD33: <i>MD Space Exp Center (MDSEC)</i>	-	0.000	0.000	16.233	-	16.233	12.706	13.726	16.444	16.878	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603895C is transferred to PE 1206895C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

A. Mission Description and Budget Item Justification

The SKA system is composed of two segments: a space segment and a ground segment.

- The space segment is composed of a network of small infrared (IR) sensors (sensors, processor cards and cabling), each mated to a different satellite. The total number of sensors and where they are placed in the network are specifically tailored for the kill assessment mission. The space segment includes key design features to improve its resiliency.
- The ground segment is a small network of desktop computers, servers and routers that monitor the health of the on-orbit sensors, command the sensors to perform the kill assessment mission and analyze the data to make a kill assessment determination for the BMDS. The ground segment also includes the equipment necessary for communications security and information assurance. The Missile Defense Space Center (MDSC) is the communications hub for SKA data, routing SKA data between the commercial payload integrator and the SKA Payload Analysis Center.

The SKA sensors are hosted on satellites that are not developed by MDA, thus schedule performance is the highest priority of the experiment. Since the launch of the host satellites will not wait for hosted payloads that are delivered late, the management of the SKA project focuses on the ability to meet schedule commitments. In the past year, the commercial satellite host and the launch site owner have made small changes to the launch schedule; however, those changes have not affected SKA delivery commitments to the satellite integrator - the SKA project remains on schedule.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Spacebased Kill Assessment	0.000	0.000	16.233
Articles:	-	-	-
Description: The SKA project is an experimental system designed to demonstrate kill assessment for Homeland Defense. It includes SKA sensor-host satellite integration and testing, launch preparations, on-orbit checkout, experimental operations, and supports engineering trade studies and concept evaluations for current and future space based sensors. Specific accomplishments by year follow.			
FY 2016 Accomplishments:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
N/A			
FY 2017 Plans: In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603895C is transferred to PE 1206895C.			
FY 2018 Plans: - Complete on-orbit deployment, checkout, calibration and commissioning of the sensor network - Begin on-orbit operations by experimenting and participating in BMDS flight tests - Analyze operations and test data to inform future decision to add SKA to BMDS operational baseline - Support concept studies and analyses for assessment sensor payload configurations - Begin development of kill assessment algorithms required to add SKA to the operational BMDS - Initiate requirements and design of SKA Payload Analysis Center at the MDSC to continue experimental operations			
Accomplishments/Planned Programs Subtotals	0.000	0.000	16.233

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,260.480	862.080	828.097	-	828.097	630.842	651.047	567.451	551.701	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	233.020	230.077	247.345	-	247.345	247.643	362.850	401.267	497.503	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	804.211	959.066	852.052	-	852.052	805.051	789.217	656.164	695.306	Continuing	Continuing
• 0603896C: <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	425.996	456.267	430.115	-	430.115	461.275	501.956	496.411	514.139	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	46.191	54.750	53.265	-	53.265	54.505	57.588	58.574	59.738	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	290.267	293.441	305.791	-	305.791	295.042	351.626	336.137	334.678	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0603915C: <i>Ballistic Missile Defense Targets</i>	517.589	563.576	410.425	-	410.425	373.203	407.909	405.458	427.508	Continuing	Continuing

Remarks

D. Acquisition Strategy

SKA leverages experience that the Johns Hopkins University Applied Physics Laboratory (JHU/APL) has with its extensive history of performing kill assessment activities and conducting experiments associated with the Aegis BMD program. JHU/APL is the developer of the SKA experiment and its primary subcontractor will be responsible for payload integration and hosting accommodation using a firm fixed price contract to contain costs. The SKA experiment uses a commercial satellite program as the platform host for a DOD payload, taking full advantage of a multi-billion dollar space and ground system that already exists. Since MDA and JHU/APL cannot impact the launch schedule of the commercial satellite host, fiscal stability and commitment is required which is a small tradeoff for the significant cost savings that commercial hosting provides.

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Spacebased Kill Assessment - SKA Contract Support Services (CSS)	C/Various	Various : CO, VA	0.000	0.000		0.000		0.247	Nov 2017	-		0.247	Continuing	Continuing	Continuing
Spacebased Kill Assessment - SKA FFRDC	FFRDC	Various : CO, AL, MD, VA, CA	0.000	0.000		0.000		0.684	Nov 2017	-		0.684	Continuing	Continuing	Continuing
Spacebased Kill Assessment - SKA IT User Services	C/CPAF	Northrop Grumman : AK, CA, CO, HI, NM, VA	0.000	0.000		0.000		0.049	Nov 2017	-		0.049	Continuing	Continuing	Continuing
Spacebased Kill Assessment - SKA MDA Civilian	Allot	MDA : VA	0.000	0.000		0.000		0.212	Oct 2017	-		0.212	Continuing	Continuing	Continuing
Spacebased Kill Assessment - SKA Program Mission Support	C/Various	Various : CO, AL, MD, VA	0.000	0.000		0.000		0.132	Nov 2017	-		0.132	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		1.324		-		1.324	-	-	-

Remarks
All efforts listed above are a continuation of PE 0603895C, MD33

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Spacebased Kill Assessment - SKA Development and Experimentation	C/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		12.232	Nov 2017	-		12.232	Continuing	Continuing	Continuing
Spacebased Kill Assessment - SKA Experimental Ops Team	C/TBD	TBD : Schriever AFB, CO	0.000	0.000		0.000		2.677	Nov 2017	-		2.677	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		14.909		-		14.909	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
All efforts listed above are a continuation of PE 0603895C, MD33

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	16.233	-	16.233	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

	Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆																			
	Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇																			
	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
FTM-29 (AEGIS 5.1, Intercept Flight Test)																												
SKA Experimentation - 1Q2018-4Q2018											△																	
SKA Launch Campaign											◇	◇																
SKA On-Orbit Check-out											◇	◇	◇	◇														
FT0-03 E1 (OTA, Intercept Flight Test)															△													
FTG-11 (IOT&E) (GM, Intercept Flight Test)																△												
FTM-31 (AEGIS SBT, Intercept Flight Test)																△												
SKA Experimentation - 1Q2019-4Q2019																												
FT0-03 E2 (OTA, Intercept Flight Test)																												
FTP-17 (IBCS Intercept Flight Test)																												
FTP-16 (IBCS Intercept Flight Test)																												
FTM-32 (AEGIS SBT, Intercept Flight Test)																												
FTM-33 (AEGIS SBT, Intercept Flight Test)																												
FEV-02 (FTM-DST 2) (AEGIS 5.0, Intercept Flight Test)																												
SKA Experimentation - 1Q2020-4Q2020																												
FTP-18 (BCS Intercept Flight Test)																												
FTP-19 (BCS Intercept Flight Test)																												
FTP-20 (BCS Intercept Flight Test)																												
FTT-19 (TH, Intercept Flight Test)																												
FTM-24 (AEGIS 5.0, Intercept Flight Test)																												
FTM-30 (AEGIS 5.1, Intercept Flight Test)																												
FTG-17 (IOT&E) (GM, Intercept Flight Test)																												
SKA Experimentation - 1Q2021-4Q2021																												
FTT-21 (TH, Intercept Flight Test)																												

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

	Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆					
	Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇					
	FY 2016		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022	
FTG-18 (GM, Intercept Flight Test)													△	
SKA Experimentation - 1Q2022-4Q2022													◇	◇
FTM-35 (AEGIS 5.1, Intercept Flight Test)														△
FTM-37 (IOT&E) (AEGIS 5.1, Intercept Flight Test)														△

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FTM-29 (AEGIS 5.1, Intercept Flight Test)	1	2018	1	2018
SKA Experimentation - 1Q2018-4Q2018	1	2018	4	2018
SKA Launch Campaign	2	2018	4	2018
SKA On-Orbit Check-out	2	2018	1	2019
FT0-03 E1 (OTA, Intercept Flight Test)	3	2018	3	2018
FTG-11 (IOT&E) (GM, Intercept Flight Test)	4	2018	4	2018
FTM-31 (AEGIS SBT, Intercept Flight Test)	1	2019	1	2019
SKA Experimentation - 1Q2019-4Q2019	1	2019	4	2019
FT0-03 E2 (OTA, Intercept Flight Test)	2	2019	2	2019
FTP-17 (IBCS Intercept Flight Test)	2	2019	2	2019
FTP-16 (IBCS Intercept Flight Test)	2	2019	2	2019
FTM-32 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
FTM-33 (AEGIS SBT, Intercept Flight Test)	3	2019	3	2019
FEV-02 (FTM-DST 2) (AEGIS 5.0, Intercept Flight Test)	4	2019	4	2019
SKA Experimentation - 1Q2020-4Q2020	1	2020	4	2020
FTP-18 (BCS Intercept Flight Test)	2	2020	2	2020
FTP-19 (BCS Intercept Flight Test)	2	2020	2	2020
FTP-20 (BCS Intercept Flight Test)	2	2020	2	2020
FTT-19 (TH, Intercept Flight Test)	3	2020	3	2020
FTM-24 (AEGIS 5.0, Intercept Flight Test)	3	2020	3	2020
FTM-30 (AEGIS 5. 1, Intercept Flight Test)	4	2020	4	2020
FTG-17 (IOT&E) (GM, Intercept Flight Test)	1	2021	1	2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD33 / <i>MD Space Exp Center (MDSEC)</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
SKA Experimentation - 1Q2021-4Q2021	1	2021	4	2021
FTT-21 (TH, Intercept Flight Test)	4	2021	4	2021
FTG-18 (GM, Intercept Flight Test)	1	2022	1	2022
SKA Experimentation - 1Q2022-4Q2022	1	2022	4	2022
FTM-35 (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022
FTM-37 (IOT&E) (AEGIS 5.1, Intercept Flight Test)	3	2022	3	2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	-	0.000	0.000	0.761	-	0.761	0.642	0.669	0.834	0.848	0	3.754
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2018, Program Wide Support was proportionately reallocated as a result of the Ballistic Missile Defense System Space Program transfer from 0603895C program element.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	0.000	0.000	0.761
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.761

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	--	--

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.000		0.015	Dec 2017	-		0.015	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various; Multi : AL, CO, VA	0.000	0.000		0.000		0.746	Dec 2017	-		0.746	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		0.761		-		0.761	-	-	-

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	0.000	0.761	-	0.761	-	-	-

Remarks
N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Missile Defense Agency						Date: May 2017									
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>							
Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆	Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇						
MD40 Program-Wide Support															

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / <i>Ballistic Missile Defense System Space Programs</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2018	4	2022

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605502C I <i>Small Business Innovation Research - MDA</i>
--	---

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	88.694	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	88.694
MD45: <i>Small Business Innovation Research</i>	-	88.694	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	88.694

Program MDAP/MAIS Code: 362

Note

Funds are transferred into this PE in the execution year.

A. Mission Description and Budget Item Justification

Small Business Innovation Research (SBIR) explores innovative concepts pursuant to Public Law 106-554 (Small Business Reauthorization Act of 2000) and Public Law 107-50 (Small Business Technology Transfer Program Reauthorization Act of 2001), which mandates a two-phase competition for small businesses with innovative technology that can be commercialized. SBIR and Small Business Technology Transfer (STTR) programs will develop new dual-use technology for future Missile Defense Agency (MDA) Ballistic Missile Defense Systems (BMDS) needs. Dual-use means that the technology will be judged on the potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new BMDS technology, and as a route to national economic growth through new commercial products. MDA will conduct the competition, award, and manage the contracts.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	88.694	0.000	0.000	-	0.000
Total Adjustments	88.694	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	88.694	0.000			
• Other Adjustment	0.000	0.000	0.000	-	0.000

Change Summary Explanation

FY 2016 funds were transferred to SBIR/STTR from other Program Elements in accordance with the SBIR/STTR Reauthorization Act of 2011

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency										Date: May 2017		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605502C / <i>Small Business Innovation Research - MDA</i>				Project (Number/Name) MD45 / <i>Small Business Innovation Research</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD45: <i>Small Business Innovation Research</i>	-	88.694	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	88.694
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funds are transferred into this Program Element in the execution year.

A. Mission Description and Budget Item Justification

The MDA's SBIR/STTR investments are divided into 16 Research Areas for the following key components:

- Aegis Ballistic Missile Defense (BMD): Develops Naval BMD Capability
- Command, Control, Communication, Computer Intelligence Surveillance and Reconnaissance (C4ISR): Defines, develops and deploys an integrated Sensor and Command and Control (C2) capability for the Ballistic Missile Defense System
- Program and Integration: Supervises the non-Aegis portfolio including Targets, Terminal High Altitude Area Defense (THAAD), Ground-based Midcourse Defense, and the Israeli programs
- Test: Characterizes ballistic missile defense capability and supports fielding of an integrated and effective capability to the Warfighter
- Advanced Technology: Develops technology to counter future threats

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
Title: Small Business Innovative Research	88.694	0.000	0.000
Articles:	-	-	-
Description: The SBIR and Small Business Technology Transfer (STTR) programs will develop new dual-use technology for future Missile Defense Agency (MDA) Ballistic Missile Defense Systems (BMDS) needs			
FY 2016 Accomplishments:			
SBIR and STTR topic areas for FY 2016 included:			
- Advanced Cognition Processing and Algorithms for Improved Identification			
- Kinematic Reach/Containment			
- System Communications			
- Lethality Enhancement			
- Gaming Trainer			
- Command and Control Human-to-Machine Interface			
- Improved Track Accuracy for Missile Engagements			
- Innovative Methodologies for Modeling Fracture Under High Strain-rate Loading			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502C / <i>Small Business Innovation Research - MDA</i>	Project (Number/Name) MD45 / <i>Small Business Innovation Research</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Thermally Efficient Emitter Technology for Advanced Scene/Simulation Capability in Hardware in the Loop Testing - Innovative Antenna Arrays Enabling Continuous Interceptor Communications - Multi-Object Payload Deployment - Interceptor Thermal Protection Systems - Low Light Short Wave Infrared Focal Plane Arrays - Solid State High Power Amplifier for Communications - Non-Destructive Testing Methods for Detecting Red Plague Within an Insulated Silver Plated Copper Conductor - Passive Inter-Modulation RF Emissions Utilized for Identifying Galvanic Corrosion in Metal Structures - Contextual Reasoning for Object Identification - System of Systems Control Interactions - Aerospace Vehicle Signature Modeling Technologies - Spectral Crosstalk Reduction for Dual-band Long Wave Infrared Detectors - Gold Contaminated Solder Joint Characterization for Quantifying Risks Associated with Gold Embrittlement - Open Framework Planner with Embedded Training - Irrefutable Tamper Evidence - Self-Building/Establishing Networks - Inline Threat Generation for Modeling and Simulation - Innovative Ways to Shorten System Level Simulation Integration Time - High Power Fiber Laser Tap Couplers for Phase and Polarization Control - General Wave-Optics Based Scaling Laws for Multiple/Obscured Apertures - Smart Readout Integrated Circuit for Dual Band Infrared Focal Plane Arrays - Advanced Reserve Battery Technologies - MEMS IMU Solutions for Missile Defense Applications - Lithium Oxyhalide Battery Separator Material <p>FY 2017 Plans: N/A</p> <p>FY 2018 Plans: N/A</p>			
Accomplishments/Planned Programs Subtotals	88.694	0.000	0.000

C. Other Program Funding Summary (\$ in Millions) N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502C / <i>Small Business Innovation Research - MDA</i>	Project (Number/Name) MD45 / <i>Small Business Innovation Research</i>

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0901598C / <i>Management HQ - MDA</i>
--	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	130.808	35.871	31.160	29.947	-	29.947	28.024	27.269	27.878	28.450	Continuing	Continuing
MD38: <i>Management Headquarters</i>	130.808	35.871	31.160	29.947	-	29.947	28.024	27.269	27.878	28.450	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

Beginning FY 2017, the Management Headquarters Activity (MHA) Program Element (PE) 0901598C decreases due to Department of Defense (DoD) reform efforts to maintain major headquarter activities' civilian staffing at reduced levels. DoD efforts to establish a common MHA framework resulted in a net funding decrease due to the transfer of civilian manpower performing functions MDA considered MHA in prior years. Funding and civilian manpower performing these non-MHA functions were appropriately transferred to Program Wide Support. Implementation of prior year efficiencies also continues in FY 2018.

Reduced funds and manpower to implement additional management headquarters civilian reductions to meet 25% reduction level by FY20.

A. Mission Description and Budget Item Justification

As prescribed by DoD Instruction 5100.73 Major Headquarters Activities, MDA's Management Headquarter supports the operation of MDA's management headquarters activities. This program element funds government civilian salaries and benefit, travel, contract support services, facility and logistics support functions, transportation subsidies, security and emergency management, and operations of non-fielded activities.

Management Headquarter Activities provide executive leadership planning, develop centralized agency policy, prepare and defend annual budget submissions, respond to external inquiries, and implement SECDEF and Presidential priorities. As a DoD research, development and acquisition agency, the Headquarter Activities provide cost efficient oversight; direction; and control of initiatives and processes that assure best value, high quality, on-time and successful performance of MDA acquisition programs. This is accomplished by ensuring acquisition and procurement program management emphasizes systems engineering; incorporates life cycle management objectives; implements risk management; and assesses cost, schedule or performance trade-offs.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
---	-----------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0901598C / <i>Management HQ - MDA</i>
--	--

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	35.871	31.160	29.814	-	29.814
Current President's Budget	35.871	31.160	29.947	-	29.947
Total Adjustments	0.000	0.000	0.133	-	0.133
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustment	0.000	0.000	0.133	-	0.133

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0901598C / Management HQ - MDA	Project (Number/Name) MD38 / Management Headquarters
--	---	--

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD38: Management Headquarters	130.808	35.871	31.160	29.947	-	29.947	28.024	27.269	27.878	28.450	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The MDA Headquarters provides oversight, direction and control over MDA's acquisition programs and fielded systems. The MDA Headquarters staff functions (government salaries, government travel, and contract support services) support the mission and operations of the world-wide MDA mission.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2016	FY 2017	FY 2018
<p>Title: MHA Civilian Salaries</p> <p align="right">Articles:</p> <p>Description: Provide mission support, oversight, and management of: - Acquisition, implementation of international initiatives to increase missile defense coverage to deployed forces and allies, efficiency-oriented administrative services, business operations, financial resources, human capital, real property, environmental compliance, general counsel, internal review, public affairs, and media release</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans: Beginning in FY 2017, civilian salaries reflect a decrease due to the transfer of non-headquarter functions from MHA to Program Wide Support. This transfer was the direct result of DoD efforts to establish a common MHA framework as a result of Department of Defense (DoD) reform efforts to maintain major headquarter activities' civilian staffing at reduced levels.</p> <p>FY 2018 Plans: N/A</p>	22.914	18.626	18.366
<p>Title: MHA Travel</p> <p align="right">Articles:</p> <p>Description: Provide mission essential government travel</p> <p>FY 2016 Accomplishments:</p>	0.999	0.991	0.990

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017		
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0901598C / Management HQ - MDA	Project (Number/Name) MD38 / Management Headquarters		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018
N/A				
FY 2017 Plans: N/A				
FY 2018 Plans: N/A				
Title: MHA Utilities, Facilities, Operations, Subsidy, Transportation and Logistics		2.410	2.131	0.000
		Articles: -	-	-
Description: Fund utilities under host-tenant agreement at MDA, Fort Belvoir - Provide base operations at MDA, Fort Belvoir - Provide transportation subsidy to National Capitol Region employees - Provide ground transportation, shuttle, and motorpool services				
FY 2016 Accomplishments: N/A				
FY 2017 Plans: N/A				
FY 2018 Plans: Beginning in FY 2018, HQ Utilities, Facilities, Operations, Subsidy, Transportation and Logistics reflect a decrease due to the transfer of non-headquarter functions from MHA to Program Wide Support, multiple program elements. This transfer was the direct result of DoD efforts to establish a common MHA framework as a result of Department of Defense (DoD) reform efforts to maintain major headquarter activities' framework.				
Title: Security and Emergency Management		3.318	3.384	0.000
		Articles: -	-	-
Description: - Provide access control and circulation enforcement for all visitors, security clearance verification, physical security checks, and information security inspections - Maintain global security situational awareness from the Global Security Operations Center (GSOC) and provide security planning and support for conferences and special events - Provide first response and emergency assessment to emergency situations and respond to alarms to include Sensitive Compartmental Information (SCI) and Special Access Program (SAP) facilities				
FY 2016 Accomplishments:				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency	Date: May 2017
--	-----------------------

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0901598C / Management HQ - MDA	Project (Number/Name) MD38 / Management Headquarters
--	---	--

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: Beginning in FY 2018, Security and Emergency Management reflect a decrease due to the transfer of non-headquarter functions from MHA to Program Wide Support, multiple program elements. This transfer was the direct result of DoD efforts to establish a common MHA framework as a result of Department of Defense (DoD) reform efforts to maintain major headquarter activities' framework.			
Title: MHA Contract Services	6.230	6.028	10.591
Articles:	-	-	-
Description: - Provide contract support services to mission activities for acquisition, business operations, internal review, general counsel, administrative support, public affairs, and international affairs			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: Beginning in FY 2018, Contract Services reflects an increase due to the transfer of MHA contract support previously programmed Program Wide Support activities, multiple program elements. This transfer was the direct result of DoD efforts to establish a common MHA framework as a result of Department of Defense (DoD) reform efforts to maintain major headquarter activities' framework.			
Accomplishments/Planned Programs Subtotals	35.871	31.160	29.947

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency **Date:** May 2017

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0901598C / <i>Management HQ - MDA</i>	Project (Number/Name) MD38 / <i>Management Headquarters</i>
--	--	---

E. Performance Metrics

N/A