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**Department of Defense
Fiscal Year (FY) 2020 Budget Estimates**

March 2019



Missile Defense Agency

Defense-Wide Justification Book Volume 2b of 2

Procurement, Defense-Wide
(Includes O&M and MILCON)

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Introduction & Explanation of Contents

The Department of Defense Fiscal Year (FY) 2020 Budget Estimates Submission 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 2020 Budget Estimates 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

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Defense-Wide
FY 2020 President's Budget
Exhibit P-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

11 Mar 2019

Appropriation -----	FY 2018 (Base + OCO) -----	FY 2019 Base Enacted -----	FY 2019 OCO Enacted -----	FY 2019 Total Enacted -----
Procurement, Defense-Wide	3,052,841	2,572,400		2,572,400
Total Defense-Wide	3,052,841	2,572,400		2,572,400

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Defense-Wide
FY 2020 President's Budget
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(Dollars in Thousands)

11 Mar 2019

Appropriation	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO
-----	-----	-----	-----	-----
Procurement, Defense-Wide	1,493,793			
Total Defense-Wide	1,493,793			

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Defense-Wide
FY 2020 President's Budget
Exhibit P-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

11 Mar 2019

Appropriation -----	FY 2020 Total (Base + OCO) -----
Procurement, Defense-Wide	1,493,793
Total Defense-Wide	1,493,793

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Defense-Wide
FY 2020 President's Budget
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(Dollars in Thousands)

11 Mar 2019

Organization: Procurement, Defense-Wide -----	FY 2018 (Base + OCO) -----	FY 2019 Base Enacted -----	FY 2019 OCO Enacted -----	FY 2019 Total Enacted -----
Missile Defense Agency, MDA	3,052,841	2,572,400		2,572,400
Total	3,052,841	2,572,400		2,572,400

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Defense-Wide
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11 Mar 2019

Organization: Procurement, Defense-Wide -----	FY 2020 Base -----	FY 2020 OCO for Base Requirements -----	FY 2020 OCO for Direct War and Enduring Costs -----	FY 2020 Total OCO -----
Missile Defense Agency, MDA	1,493,793			
Total	1,493,793			

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FY 2020 President's Budget
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Total Obligational Authority
(Dollars in Thousands)

11 Mar 2019

Organization: Procurement, Defense-Wide -----	FY 2020 Total (Base + OCO) -----
Missile Defense Agency, MDA	1,493,793
Total	1,493,793

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Defense-Wide
FY 2020 President's Budget
Exhibit P-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

11 Mar 2019

Appropriation: Procurement, Defense-Wide

Budget Activity -----	FY 2018 (Base + OCO) -----	FY 2019 Base Enacted -----	FY 2019 OCO Enacted -----	FY 2019 Total Enacted -----
01. Major Equipment	3,052,841	2,572,400		2,572,400
Total Procurement, Defense-Wide	3,052,841	2,572,400		2,572,400

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Appropriation: Procurement, Defense-Wide

Budget Activity -----	FY 2020 Base -----	FY 2020 OCO for Base Requirements -----	FY 2020 OCO for Direct War and Enduring Costs -----	FY 2020 Total OCO -----
01. Major Equipment	1,493,793			
Total Procurement, Defense-Wide	1,493,793			

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11 Mar 2019

Appropriation: Procurement, Defense-Wide

Budget Activity -----	FY 2020 Total (Base + OCO) -----
01. Major Equipment	1,493,793
Total Procurement, Defense-Wide	1,493,793

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 FY 2020 President's Budget
 Exhibit P-1 FY 2020 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

11 Mar 2019

Appropriation: 0300D Procurement, Defense-Wide

Line No	Item Nomenclature	Ident Code	FY 2018 (Base + OCO)		FY 2019 Base Enacted		FY 2019 OCO Enacted		FY 2019 Total Enacted		S e c
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	
Budget Activity 01: Major Equipment											
Major Equipment, Missile Defense Agency											
28	THAAD	B	109	1,125,732	96	1,014,068			96	1,014,068	U
29	Ground Based Midcourse Less: Advance Procurement (PY)	A	10	(180,000)	16	(505,600)			16	(505,600)	U
						(-88,000)				(-88,000)	U
				180,000		417,600				417,600	
30	Ground Based Midcourse Advance Procurement (CY) C (FY 2018 for FY 2019) (M) C (FY 2019 for FY 2020) (M)			88,000 (88,000)		115,000				115,000	U
						(115,000)				(115,000)	
31	Aegis BMD	B	64	1,083,353	44	700,490			44	700,490	U
32	Aegis BMD Advance Procurement (CY) C (FY 2020 for FY 2021) (M) C (FY 2020 for FY 2022) (M) C (FY 2020 for FY 2023) (M)										U
33	BMDS AN/TPY-2 Radars	A		11,947		13,185				13,185	U
34	Arrow 3 Upper Tier Systems	A	1	120,000	1	80,000			1	80,000	U
35	Short Range Ballistic Missile Defense (SRBMD)	A	1	120,000	1	50,000			1	50,000	U
36	Aegis Ashore Phase III	B	1	74,739	1	15,000			1	15,000	U
37	Iron Dome	A	1	92,000	1	70,000			1	70,000	U

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Appropriation: 0300D Procurement, Defense-Wide

Line No	Item Nomenclature	Ident Code	FY 2020 Base		FY 2020 OCO for Base Requirements		FY 2020 OCO for Direct War and Enduring Costs		FY 2020 Total OCO		S e c
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	
Budget Activity 01: Major Equipment											
Major Equipment, Missile Defense Agency											
28	THAAD	B	37	425,863							U
29	Ground Based Midcourse	A		(124,471)							U
	Less: Advance Procurement (PY)			(-115,000)							U
				9,471							
30	Ground Based Midcourse Advance Procurement (CY)										U
	C (FY 2018 for FY 2019) (M)										
	C (FY 2019 for FY 2020) (M)										
31	Aegis BMD	B	37	600,773							U
32	Aegis BMD Advance Procurement (CY)			96,995							U
	C (FY 2020 for FY 2021) (M)			(46,024)							
	C (FY 2020 for FY 2022) (M)			(29,920)							
	C (FY 2020 for FY 2023) (M)			(21,051)							
33	BMDS AN/TPY-2 Radars	A		10,046							U
34	Arrow 3 Upper Tier Systems	A	1	55,000							U
35	Short Range Ballistic Missile Defense (SRBMD)	A	1	50,000							U
36	Aegis Ashore Phase III	B	1	25,659							U
37	Iron Dome	A	1	95,000							U

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Appropriation: 0300D Procurement, Defense-Wide

Line No	Item Nomenclature	Ident Code	FY 2020 Total (Base + OCO)		S e c
			Quantity	Cost	
Budget Activity 01: Major Equipment					
Major Equipment, Missile Defense Agency					
28	THAAD	B	37	425,863	U
29	Ground Based Midcourse	A		(124,471)	U
	Less: Advance Procurement (PY)			(-115,000)	U
				9,471	
30	Ground Based Midcourse Advance Procurement (CY)				U
	C (FY 2018 for FY 2019) (M)				
	C (FY 2019 for FY 2020) (M)				
31	Aegis BMD	B	37	600,773	U
32	Aegis BMD Advance Procurement (CY)			96,995	U
	C (FY 2020 for FY 2021) (M)			(46,024)	
	C (FY 2020 for FY 2022) (M)			(29,920)	
	C (FY 2020 for FY 2023) (M)			(21,051)	
33	BMDS AN/TPY-2 Radars	A		10,046	U
34	Arrow 3 Upper Tier Systems	A	1	55,000	U
35	Short Range Ballistic Missile Defense (SRBMD)	A	1	50,000	U
36	Aegis Ashore Phase III	B	1	25,659	U
37	Iron Dome	A	1	95,000	U

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(Dollars in Thousands)

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Appropriation: 0300D Procurement, Defense-Wide

Line No	Item Nomenclature	Ident Code	FY 2018 (Base + OCO)		FY 2019 Base Enacted		FY 2019 OCO Enacted		FY 2019 Total Enacted		S e c
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	
38	Aegis BMD Hardware and Software	A	22	157,070	28	97,057			28	97,057	U
	Total Major Equipment			3,052,841		2,572,400				2,572,400	
	Total Procurement, Defense-Wide			3,052,841		2,572,400				2,572,400	

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Appropriation: 0300D Procurement, Defense-Wide

Line No	Item Nomenclature	Ident Code	FY 2020 Base		FY 2020 OCO for Base Requirements		FY 2020 OCO for Direct War and Enduring Costs		FY 2020 Total OCO		S e c
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	
38	Aegis BMD Hardware and Software	A	36	124,986							U
Total Major Equipment				1,493,793							
Total Procurement, Defense-Wide				1,493,793							

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Appropriation: 0300D Procurement, Defense-Wide

Line No	Item Nomenclature	Ident Code	FY 2020 Total (Base + OCO)		S e c
			Quantity	Cost	
38	Aegis BMD Hardware and Software	A	36	124,986	U
Total Major Equipment				1,493,793	
Total Procurement, Defense-Wide				1,493,793	

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29	01	17	MD08	Ground Based Midcourse.....	Volume 2b - 21
30	01	17	MD08	Ground Based Midcourse, Advance Procurement.....	Volume 2b - 33
31	01	17	MD09	AEGIS BMD.....	Volume 2b - 41
32	01	17	MD09	AEGIS BMD, Advance Procurement.....	Volume 2b - 59
33	01	17	MD11	BMDS Sensors.....	Volume 2b - 63
34	01	17	MD26	Arrow 3 Upper Tier System.....	Volume 2b - 83
35	01	17	MD34	Short Range Ballistic Missile Defense (SRBMD) (David's Sling Weapon System (DSWS)).....	Volume 2b - 87
36	01	17	MD73	Aegis Ashore Phase III.....	Volume 2b - 91
37	01	17	MD83	Iron Dome.....	Volume 2b - 95
38	01	17	MD90	Aegis BMD Hardware and Software.....	Volume 2b - 99

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AEGIS BMD, Advance Procurement	MD09	32	01	17.....	Volume 2b - 59
Aegis Ashore Phase III	MD73	36	01	17.....	Volume 2b - 91
Aegis BMD Hardware and Software	MD90	38	01	17.....	Volume 2b - 99
Arrow 3 Upper Tier System	MD26	34	01	17.....	Volume 2b - 83
BMDS Sensors	MD11	33	01	17.....	Volume 2b - 63
Ground Based Midcourse	MD08	29	01	17.....	Volume 2b - 21
Ground Based Midcourse, Advance Procurement	MD08	30	01	17.....	Volume 2b - 33
Iron Dome	MD83	37	01	17.....	Volume 2b - 95
Short Range Ballistic Missile Defense (SRBMD) (David's Sling Weapon System (DSWS)	MD34	35	01	17.....	Volume 2b - 87
THAAD	MD07	28	01	17.....	Volume 2b - 1

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Fiscal Year (FY) 2020 President's Budget
Operation and Maintenance, Defense-Wide
Missile Defense Agency



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MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

<u>Appropriation Summary</u>	<u>FY 2018 Actuals</u>	<u>Price Change</u>	<u>Program Change</u>	<u>FY 2019 Enacted</u>	<u>Price Change</u>	<u>Program Change</u>	<u>FY 2020 Estimate</u>
O&M, Defense-Wide	\$491.2	\$8.8	\$-27.5	\$472.5	\$9.4	\$40.6	\$522.5

Description of Operations Financed:

MDA BMD operations and maintenance support are funded through the O&M Defense-wide appropriation. Operations include Aegis BMD that provides a wide range of support activities for deployed Aegis BMD ships and Aegis Ashore facilities including Standard Missile-3 (SM-3) Sustainment, BMD Aegis Weapon System (AWS) Sustainment, and sustainment for Aegis Ashore sites. Ground-Based Midcourse Defense for weapon system maintenance, repair, storage, training, supply support, sustaining engineering, network operations, integrated logistics support, configuration control, scheduling, execution control, system transitioning, mission operations support, and performance reporting. Additionally, funding provides Base Operations Support (BOS), communication support, and utilities for facility sustainment and maintenance at the various GMD sites. Ballistic Missile Defense System (BMDS) AN/TPY-2 Radars for sustainment of 12 Army Navy/Transportable Radar Surveillance and Control-2 radars including forward-based radars and Terminal High Altitude Area Defense configured radars to include supply support, repair, maintenance, modernization, transportation, parts storage, Special Tools and Test Equipment, recurring and delta training, training device maintenance, engineering support, Interactive Electronic Technical Manual (IETM) updates, software user guide updates, software revision certification and depot-level maintenance for the Forward Based Mode (FBM) missile defense unique equipment and Terminal High Altitude Area Defense (THAAD) which supports MDAs responsibility for the sustainment of the THAAD missile defense unique or developmental items, while the U.S. Army is responsible for the operations and sustainment of the common items.

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MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

	FY 2018	FY 2019	FY 2020
	<u>Actuals</u>	<u>Enacted</u>	<u>Estimate</u>
4. Administrative and Servicewide Activities	491,179	472,473	522,529
Aegis BMD Program	74,208	78,074	75,237
BMDS Radars Program	208,176	167,635	194,255
Ground-Based Midcourse Program	138,751	139,204	153,218
THAAD Program	70,044	87,560	99,819
Total Operation and Maintenance, Defense-Wide	491,179	472,473	522,529

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MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

	FY 2018	FY 2019	FY 2020
	<u>Actuals</u>	<u>Enacted</u>	<u>Estimate</u>
4. Administrative and Servicewide Activities	491,179	472,473	522,529
Aegis BMD Program	74,208	78,074	75,237
BMDS Radars Program	208,176	167,635	194,255
Ground-Based Midcourse Program	138,751	139,204	153,218
THAAD Program	70,044	87,560	99,819
Total Operation and Maintenance, Defense-Wide	491,179	472,473	522,529

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MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

	<u>FY 2018</u>	<u>Price</u>	<u>Price</u>	<u>Program</u>	<u>FY 2019</u>	<u>Price</u>	<u>Price</u>	<u>Program</u>	<u>FY 2020</u>	
	<u>Program</u>	<u>Growth</u>	<u>Growth</u>	<u>Growth</u>	<u>Program</u>	<u>Growth</u>	<u>Growth</u>	<u>Growth</u>	<u>Program</u>	
		<u>Percent</u>				<u>Percent</u>				
<u>Travel</u>										
308	Travel of Persons	188	1.80%	3	-191	0	2.00%	0	220	220
399	Total Travel	188		3	-191	0		0	220	220
<u>Supplies & Materials</u>										
401	DLA Energy (Fuel Products)	0	-0.40%	0	700	700	-0.67%	-5	151	846
499	Total Supplies & Materials	0		0	700	700		-5	151	846
<u>DWCF Purchases</u>										
677	DISA Telecomm Svcs - Reimbursable	2,425	1.90%	46	-2,471	0	2.00%	0	0	0
699	Total DWCF Purchases	2,425		46	-2,471	0		0	0	0
<u>Transportation</u>										
771	Commercial Transport	4,452	1.80%	80	1,366	5,898	2.00%	118	-2,421	3,595
799	Total Transportation	4,452		80	1,366	5,898		118	-2,421	3,595
<u>Other Purchases</u>										
912	Rental Payments to GSA (SLUC)	0	1.80%	0	253	253	2.00%	5	-10	248
913	Purchased Utilities (Non-Fund)	2,269	1.80%	41	24	2,334	2.00%	47	41	2,422
914	Purchased Communications (Non-Fund)	83	1.80%	1	666	750	2.00%	15	1,768	2,533
915	Rents (Non-GSA)	1,226	1.80%	22	-1,248	0	2.00%	0	0	0
920	Supplies & Materials (Non-Fund)	31,988	1.80%	576	11,327	43,891	2.00%	878	-24,188	20,581
922	Equipment Maintenance By Contract	338,326	1.80%	6,090	-35,278	309,138	2.00%	6,183	30,236	345,557
923	Facilities Sust, Rest, & Mod by Contract	35,760	1.80%	644	-13,406	22,998	2.00%	460	3,685	27,143
925	Equipment Purchases (Non-Fund)	0	1.80%	0	3,448	3,448	2.00%	69	-3,266	251
930	Other Depot Maintenance (Non-Fund)	13,966	1.80%	251	19,377	33,594	2.00%	672	44,481	78,747
932	Mgt Prof Support Svcs	1,602	1.80%	29	-681	950	2.00%	19	117	1,086

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

	<u>FY 2018</u>	<u>Price</u>	<u>Price</u>	<u>Program</u>	<u>FY 2019</u>	<u>Price</u>	<u>Price</u>	<u>Program</u>	<u>FY 2020</u>
	<u>Program</u>	<u>Growth</u>	<u>Growth</u>	<u>Growth</u>	<u>Program</u>	<u>Growth</u>	<u>Growth</u>	<u>Growth</u>	<u>Program</u>
		<u>Percent</u>				<u>Percent</u>			
934 Engineering & Tech Svcs	2,137	1.80%	38	327	2,502	2.00%	50	900	3,452
937 Locally Purchased Fuel (Non-Fund)	1,250	-0.40%	-5	-1,245	0	-0.67%	0	0	0
984 Equipment Contracts	3,814	1.80%	69	-3,842	41	2.00%	1	1,804	1,846
987 Other Intra-Govt Purch	34,131	1.80%	614	2,105	36,850	2.00%	737	-13,250	24,337
989 Other Services	9,710	1.80%	175	-826	9,059	2.00%	181	-575	8,665
990 IT Contract Support Services	7,852	1.80%	141	-7,926	67	2.00%	1	932	1,000
999 Total Other Purchases	484,114		8,686	-26,925	465,875		9,318	42,675	517,868
Total	491,179		8,815	-27,521	472,473		9,431	40,625	522,529

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>Change</u> <u>FY 2019/2020</u>
Contractor FTEs (Total)	986	1,067	1,031	-36

Personnel Summary Explanations:

The FY 2019 to FY 2020 the net decrease in contractor FTEs reflects the following changes:

- A reduction of -40 contractor FTEs in the BMDS Radar Program due to reduced contractor requirements.
- The THAAD Program decrease of -11 contractor FTEs is due to the continued transition from the prime contractor to an organic capability for sustainment and maintenance of THAAD post-deployed system software.
- The decrease of -9 FTEs in Aegis BMD Program is due to the reduction in SM-3 IA/IB recertification, G-switch and TSRM efforts.
- Ground-Based Midcourse Defense Program increases at GMD sites to support added requirements due to missile field expansion and host base increased communications support at Fort Greely, AK, twenty-four hour assured maintenance response capability, and increased cyber defense at GMD sites resulting in an overall increase of +24 FTEs.

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
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MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

	<u>TOTAL</u>
FY 2019 President's Budget Request (Amended, if applicable)	499,817
1. Congressional Adjustments	
a. Distributed Adjustments	
1) Re-baselining of Requirements	-26,150
b. Undistributed Adjustments	
1) Across-The-Board Reduction: Historical Underexecution	-1,283
c. Adjustments to Meet Congressional Intent	
d. General Provisions	
1) Fuel Increase (Section 8118)	89
FY 2019 Appropriated Amount	472,473
2. War-Related and Disaster Supplemental Appropriations	
3. Fact-of-Life Changes	
FY 2019 Baseline Funding	472,473
4. Reprogrammings (Requiring 1415 Actions)	
Revised FY 2019 Estimate	472,473
5. Less: Item 2, War-Related and Disaster Supplemental Appropriations and Item 4, Reprogrammings	
FY 2019 Normalized Current Estimate	472,473
6. Price Change	9,431
7. Functional Transfers	
8. Program Increases	
a. Annualization of New FY 2019 Program	
b. One-Time FY 2020 Increases	
c. Program Growth in FY 2020	

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	<u>TOTAL</u>
1) BMDS Radars Program	23,274
2) Aegis BMD Program	12,545
3) Ground-Based Midcourse Defense Program	12,460
4) THAAD Program	10,511
9. Program Decreases	
a. Annualization of FY 2019 Program Decreases	
b. One-Time FY 2019 Increases	
c. Program Decreases in FY 2020	
1) Aegis BMD SM-3 Program	-14,941
2) Aegis Ashore Program	-2,000
3) Ground Based Midcourse Defense Program	-1,224
FY 2020 Budget Request	522,529

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**Operation and Maintenance, Defense-Wide Summary (\$ in thousands)
Budget Activity (BA) 4: Administration and Service-Wide Activities**

	FY 2018 <u>Actuals</u>	Price <u>Change</u>	Program <u>Change</u>	FY 2019 <u>Enacted</u>	Price <u>Change</u>	Program <u>Change</u>	FY 2020 <u>Estimate</u>
MDA	491,179	8,815	-27,521	472,473	9,431	40,625	522,529

I. Description of Operations Financed: Provides the following Ballistic Missile Defense (BMD) operations and maintenance support:

A. Aegis Ballistic Missile Defense (BMD). Funding provides a wide range of support activities for deployed Aegis BMD ships and Aegis Ashore facilities including Standard Missile (SM-3) sustainment, BMD Aegis Weapons System (AWS) sustainment, and sustainment for Aegis Ashore sites.

The SM-3 sustainment program includes the recertification/repair of missiles, installation of software and hardware updates, demilitarization of SM-3 missiles, modeling and simulation and logistics efforts, and also provides missile transportation back to the second destination upon completion of recertification and repairs.

The BMDS AWS sustainment program provides technical and engineering services for in-service BMD ships and sites, along with infrastructure maintenance for BMDS platforms executing BMD test missions, to ensure the in-service BMD AWS baselines maintain the directed operational availability. The BMD AWS sustainment effort includes: BMD Engineering Agent technical support and operational analysis for BMD units; engineering reach-back services supporting casualty correction, issues, and improvements; maintenance, certification, and delivery of BMD AWS computer program updates to the Fleet; Aegis software maintenance corrections in the common source library; test site infrastructure and maintenance; integrated logistics support of BMD unique parts, technical documentation review and implementation of updated maintenance concepts;

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I. Description of Operations Financed (cont.)

diminishing manufacturing sources (DMS), and obsolete materiel surveillance, identification, and resolution maintenance actions on BMD ships and sites participating in MDA sponsored test missions.

The Aegis BMD effort also provides engineering services for Aegis Ashore Host Nation repairs and rework required post construction activities in support of site transition. This includes Host Nation planning yard activities to track modernization; updates to the Aegis Ashore technical data package to ensure core Aegis Ashore Deckhouse attributes are maintained; development of required test procedures to support on-site installation and checkout (INCO) and system operations verification testing (SOVT) and provides updates to training, warfighter technical publications, and the initial outfitting requirements for maintenance and logistics materiel.

B. Ground Based Midcourse (GMD). Funding provides weapon system equipment maintenance, repair, storage, training, supply support, sustaining engineering, network operations, integrated logistics support, configuration control, scheduling, execution control, system transitioning, mission operations support and performance reporting. Additionally, funding provides Base Operations Support (BOS), communications support, and utilities for facility sustainment and maintenance at the various GMD sites.

C. Ballistic Missile Defense Systems (BMDS) Radars. Funding provides sustainment of 12 Army Navy/Transportable Radar Surveillance and Control-2 (AN/TPY-2) Forward-Based and Terminal High Altitude Area Defense (THAAD) configured Terminal Mode radars to include supply support, repair, maintenance, modernization, transportation, parts, storage, special tools and test equipment, recurring and delta training, technical interface, training device maintenance, engineering support, interactive electronic technical manual (IETM) updates, software user guide updates, software revision certification, and depot-level maintenance for MDA's missile defense unique equipment. Funding also provides

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I. Description of Operations Financed (cont.)

Electronic Equipment Unit (EEU) retrofits at Letterkenny Army Depot to replace obsolete equipment, incorporate updates to upgrade servers, and enhance radar capabilities. Additionally, funding provides sustainment unique to the MDA Missile Defense mission for the Upgraded Early Warning Radar (UEWR)/COBRA DANE Radar, which MDA sustains and operates in conjunction with the U.S. Air Force.

D. Terminal High Altitude Area Defense (THAAD). The MDA is responsible for the sustainment for the THAAD missile defense unique or development items, while the U.S. Army is responsible for the operations and sustainment of the common items. The MDA funding provides sustainment for all fielded THAAD Batteries, ensures THAAD assets are properly maintained and ensures crews are trained to meet Combatant Commander needs including:

1. Field and sustainment level supply, maintenance, modernization, hazardous materials/waste disposal, and depot-level maintenance for THAAD missile defense unique equipment.
2. Spares, Interceptor spares, repair parts, and maintenance capability at the location of each THAAD battery.
3. Engineering support for the THAAD missile defense unique equipment.
4. Deployment software support for fielded software, to include deficiency report review, error correction, incremental capability improvements, and hardware/system interface compatibility maintenance.
5. Missile transportation and handling from the missile storage location to the site of the THAAD launchers.
6. IETM updates software users' guide updates, and software revision certification.
7. Maintenance and upkeep for all THAAD training devices.

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I. Description of Operations Financed (cont.)

8. Supply, maintenance and transportation support for all new equipment training, and sustainment training relating to design changes and equipment upgrades.
9. Special tools and test equipment for the organic depot.

II. Force Structure Summary:

N/A

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III. Financial Summary (\$ in thousands)

	FY 2019						
	FY 2018 <u>Actuals</u>	Budget <u>Request</u>	<u>Congressional Action</u>		<u>Appropriated</u>	Current <u>Enacted</u>	FY 2020 <u>Estimate</u>
			<u>Amount</u>	<u>Percent</u>			
A. BA Subactivities							
4. Administrative and Servicewide Activities	491,179	499,817	-27,344	-5.5	472,473	472,473	522,529
Aegis BMD Program	74,208	83,837	-5,763	-6.9	78,074	78,074	75,237
BMDS Radars Program	208,176	176,143	-8,508	-4.8	167,635	167,635	194,255
Ground-Based Midcourse Program	138,751	147,229	-8,025	-5.5	139,204	139,204	153,218
THAAD Program	70,044	92,608	-5,048	-5.5	87,560	87,560	99,819
Total	491,179	499,817	-27,344	-5.5	472,473	472,473	522,529

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III. Financial Summary (\$ in thousands)

<u>B. Reconciliation Summary</u>	<u>Change</u> <u>FY 2019/FY 2019</u>	<u>Change</u> <u>FY 2019/FY 2020</u>
Baseline Funding	499,817	472,473
Congressional Adjustments (Distributed)	-26,150	
Congressional Adjustments (Undistributed)	-1,283	
Adjustments to Meet Congressional Intent		
Congressional Adjustments (General Provisions)	89	
Subtotal Appropriated Amount	472,473	
Fact-of-Life Changes (2019 to 2019 Only)		
Subtotal Baseline Funding	472,473	
Supplemental		
Reprogrammings		
Price Changes		9,431
Functional Transfers		
Program Changes		40,625
Current Estimate	472,473	522,529
Less: Wartime Supplemental		
Normalized Current Estimate	472,473	

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III. Financial Summary (\$ in thousands)

<u>C. Reconciliation of Increases and Decreases</u>	<u>Amount</u>	<u>Totals</u>
FY 2019 President's Budget Request (Amended, if applicable)		499,817
1. Congressional Adjustments		-27,344
a. Distributed Adjustments		
1) Re-baselining of Requirements	-26,150	
b. Undistributed Adjustments		
1) Across-The-Board Reduction: Historical Underexecution	-1,283	
c. Adjustments to Meet Congressional Intent		
d. General Provisions		
1) Fuel Increase (Section 8118)	89	
FY 2019 Appropriated Amount		472,473
2. War-Related and Disaster Supplemental Appropriations		
3. Fact-of-Life Changes		
FY 2019 Baseline Funding		472,473
4. Reprogrammings (Requiring 1415 Actions)		
Revised FY 2019 Estimate		472,473
5. Less: Item 2, War-Related and Disaster Supplemental Appropriations and Item 4, Reprogrammings		
FY 2019 Normalized Current Estimate		472,473
6. Price Change		9,431
7. Functional Transfers		
8. Program Increases		58,790
a. Annualization of New FY 2019 Program		
b. One-Time FY 2020 Increases		
c. Program Growth in FY 2020		
1) BMDS Radars Program	23,274	
+\$13,681 increase for AN/TPY-2 Cooling Equipment Unit (CEU) refurbishments due to criticality for both forward based and terminal mode radars located in multiple geographical locations. Depot-level		

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III. Financial Summary (\$ in thousands)

C. <u>Reconciliation of Increases and Decreases</u>	<u>Amount</u>	<u>Totals</u>
<p>maintenance is required to restore CEU equipment used in the high optempo corrosive environments to ensure 24 hours a day, 365 days per year availability.</p> <p>+ \$9,593 provides increased funding to procure mission-critical and fleet spares required due to the high optempo corrosive environments to ensure 24 hours a day, 365 days per year availability. (FY 2019 Baseline: \$167,635 thousand; +0 FTEs)</p>		
<p>2) Aegis BMD Program</p> <p>+ \$12,545 provides for the transition from RDT&E to O&M for non-developmental engineering site and Common Source Library (CSL) Software Maintenance costs for the BMDS mission specific Aegis BL 9.2 (BMD 5.1) which has now been certified and operational. (FY 2019 Baseline: \$78,074 thousand; +0 FTEs)</p>	12,545	
<p>3) Ground-Based Midcourse Defense Program</p> <p>+ 3,897 provides increased cyber defense posture and cyber threat awareness at GMD sites; includes establishing a Network Intrusion Monitoring (NIM) team at Fort Greely to provide greater cyber defense.</p> <p>+ 3,589 provides additional contractor personnel required to ensure immediate 24/7 maintenance response and operational reporting for weapon system issues at all GMD sites.</p> <p>+ \$3,514 funds increased operations, sustainment, maintenance, operational support and equipment</p>	12,460	

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III. Financial Summary (\$ in thousands)

C. <u>Reconciliation of Increases and Decreases</u>	<u>Amount</u>	<u>Totals</u>
required for the new missile field at Fort Greely, AK.		
+ \$1,460 thousand funds an improved host base communications at Fort Greely, AK to address obsolescence issues, provides enhanced communications infrastructure, increased maintenance and repair and telephone upgrades. (FY 2019 Baseline: \$139,204 thousand; +0 FTEs)		
4) THAAD Program	10,511	
+ \$4,140 funds additional Post Deployment Software Support for the 4th deployed THAAD battery, to resolve increased User anomaly submissions and Software Change Requests, multi-version integration testing, and simultaneous development of multiple S/W baselines.		
+ \$1,790 funds the purchase of test program sets (TPS) (below the procurement funding threshold) to establish the capability to repair and maintain depot level reparables (DLR) at Letterkenny Army Depot that were previously tested at a prime contractor facility. The transition from contract repair to a depot program is IAW 10 U.S.C. 2464 which mandates DoD maintain a core capability that is government-owned and government operated with government equipment and facilities. The DLRs (ie: Power Management Unit, Power Filter Unit, Tactical Operation Station and Launch Control Station Power		

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III. Financial Summary (\$ in thousands)

C. Reconciliation of Increases and Decreases

Amount

Totals

Distribution Units, Radio Power Supply etc.) require testing as a quality measure and final step in the overhaul or repair before the asset is returned to the field. The TPS provide the depot with this testing capability.

+\$1,651 provides additional sustainment support, deployed contractor support, and increased transportation cost for spares/repair parts required for the increase from three in FY 2019 to four deployed OCONUS batteries in FY 2020. Deployments are planned based on COCOM requirements and needs. Additional information can be provided at the appropriate level of security classification.

+\$1,600 funds an increase in THAAD battery sustainment costs due to the addition of new site requirements associated with the implementation of the remote launcher capability concept for support. This new support concept means that batteries with a remote launcher capability will no longer operate from a single location, and will instead need to be able to be supported at multiple locations in that area of operations beginning in FY 2020.

+\$1,330 funds the purchase of spare components required to repair increasing numbers of failed THAAD interceptors and return them to the field in a timely manner. Due to the age and quantity of fielded

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III. Financial Summary (\$ in thousands)

C. <u>Reconciliation of Increases and Decreases</u>	<u>Amount</u>	<u>Totals</u>
interceptors, the use of spares is cost effective tool that can provide a quick repair and return of interceptors to the field, supporting the demanding readiness levels for this weapon system. (FY 2019 Baseline: \$87,560 thousand; +0 FTEs)		
9. Program Decreases		-18,165
a. Annualization of FY 2019 Program Decreases		
b. One-Time FY 2019 Increases		
c. Program Decreases in FY 2020		
1) Aegis BMD SM-3 Program	-14,941	
-\$7,849 reflects a reduction of SM-3 Block IA/B missile recertifications from 79 in FY 2019 to 32 in FY 2020 due to Navy Fleet Forces Command changes in ship and missile availability. The reductions in recertifications will not impact fleet capacity. Missiles are planned for recertification every 4 years based on the placed-in-service date and when ships are planned to be in port for the offload and replacement of the missiles; the timing of recertifications is based upon warfighter requirements and availability of missiles.		
-\$7,092 reflects a reduction in estimated repairs made during missile recertification (such as G-switch replacement and Third Stage Rocket Motor (TSRM) nozzle replacement) that corresponds with the reduction of planned missile recertifications. (FY 2019 Baseline: \$78,074 thousand)		
2) Aegis Ashore Program	-2,000	

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III. Financial Summary (\$ in thousands)

C. <u>Reconciliation of Increases and Decreases</u>	<u>Amount</u>	<u>Totals</u>
-\$2,000 reflects the delay in completion of the Poland Military Construction project and stand up the Aegis Ashore Commission System from FY 2018 to FY 2020. (A warranty is in place while the project undergoes construction which includes engineering, preventive and corrective maintenance of the systems.) (FY 2019 Baseline: \$78,074 thousand; +0 FTEs)		
3) Ground Based Midcourse Defense Program	-1,224	
-\$1,224 reflects fewer requirements for operational weapons system materiel purchases resulting from completion of the High Powered Amplifier (HPA) Radio Frequency Output Assembly (RFOA) obsolescence mitigation effort in FY 2019 at the GMD remote communication sites. The previous shortage of spare parts required the prime contractor to initiate obsolescence mitigation efforts resulting in a purchase of additional HPA RFOAs which are now in use. (FY 2019 Baseline: \$139,204 thousand)		
FY 2020 Budget Request		522,529

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IV. Performance Criteria and Evaluation Summary:

	FY 2018 <u>Actuals</u>	FY 2019 <u>Enacted</u>	FY 2020 <u>Estimate</u>
1. Operational Support	491,179	472,473	522,529
Aegis Program	74,208	78,074	75,237
Ground Base Midcourse	138,751	139,204	153,218
BMDS Radars	208,176	167,635	194,255
THAAD Program	70,044	87,560	99,819
Total Operations and Maintenance, Defense Wide	491,179	472,473	522,529

The MDA 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.

A. Aegis BMD. The Aegis BMD element of the BMDS capitalizes upon and evolves from the existing U. S. 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, medium-range, and intermediate-range ballistic missiles in the midcourse phase of flight and shorter range missile in terminal phase. Aegis BMD also provides a long range surveillance and track (LRS&T) capability to the BMDS. By the end of FY 2020, there will be 41 total BMDS capable ships, which is an increase of 4 ships from FY 2019, requiring maintenance support.

B. Ground-Based Midcourse (GMD). The GMD fielded weapon system is under the command of U.S. Northern Command (NORTHCOM) and is operated by Soldiers from the 100th Missile Defense Brigade (five crews) headquartered at Schriever AFB (SAFB), Colorado, and its

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IV. Performance Criteria and Evaluation Summary:

49th Missile Defense Battalion (five crews) at Fort Greely, Alaska (FGA). In FY 2020, MDA continues to support 44 operationally deployed GBIs located at FGA (40 GBIs) and Vandenberg Air Force Base, California (VAFB) (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 GMD Fire Control System consists of redundant fire control nodes at FGA (two each) and the Missile Defense Integration and Operations Center (MDIOC) (two each) at SAFB. In-Flight Interceptor Communications System (IFICS) Data Terminals (IDTs) are currently located at FGA (two each) VAFB (two each) Eareckson Air Station, Alaska (EAS) and Fort Drum, New York. In FY 2020, MDA will initiate maintenance and support for the new Missile Field 4 at Fort Greely, Alaska.

C. Ballistic Missile Defense Systems (BMDS) Radars Program. The MDA continues to sustain 12 Army Navy/Transportable Radar Surveillance and Control-2 (AN/TPY-2) radars. Five Forward-Based radars at fixed radar sites operate continuously 24 hours a day, 7 days a week, 365 days a year. Seven radars operate in Terminal Mode when integrated with the THAAD battery. The operational tempo is met utilizing military personnel and contractor logistics support (CLS) to operate and maintain the radar. FY 2020 includes AN/TPY-2 operations and maintenance plan and an increase in Depot Level Maintenance for CEU refurbishments due to high optempo corrosive environments.

D. Terminal High Altitude Area Defense (THAAD). Army force structure for THAAD is remains set at seven batteries with six launchers operated by 95 Soldiers. The battery is organized to conduct 120-day deployments (45 days of entry operations and 75 days of 17-hour/day combat operations). During actual deployments, batteries have been operating at a 24 hours a day, 7 days a week, 365 days a year operational tempo, with increased CLS costs. This increased tempo has been sustained through the increase of appropriate attachments and support. Additionally, increasing OCONUS stationing of THAAD Batteries

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IV. Performance Criteria and Evaluation Summary:

by the Army drives an increase in costs for deployed contractor support, increased transportation costs for spares/repair parts and increased quantities of stocks to support separate locations that have remote launcher capability.

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V. <u>Personnel Summary</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>Change FY 2018/ FY 2019</u>	<u>Change FY 2019/ FY 2020</u>
<u>Contractor FTEs (Total)</u>	<u>986</u>	<u>1,067</u>	<u>1,031</u>	<u>81</u>	<u>-36</u>

The FY 2019 to FY 2020 the net decrease in contractor FTEs reflects the following changes:

- A reduction of -40 contractor FTEs in the BMDS Radar Program due to reduced contractor requirements.
- The THAAD Program decrease of -11 contractor FTEs is due to the continued transition from the prime contractor to an organic capability for sustainment and maintenance of THAAD post-deployed system software.
- The decrease of -9 FTEs in Aegis BMD Program is due to the reduction in SM-3 IA/IB recertification, G-switch and TSRM efforts.
- Ground-Based Midcourse Defense Program increases at GMD sites to support added requirements due to missile field expansion and host base increased communications support at Fort Greely, AK, twenty-four hour assured maintenance response capability, and increased cyber defense at GMD sites resulting in an overall increase of +24 FTEs.

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VI. OP 32 Line Items as Applicable (Dollars in thousands):

<u>OP 32 Line</u>	<u>FY 2018</u> <u>Actuals</u>	<u>Change</u> <u>FY 2018/FY 2019</u>		<u>FY 2019</u> <u>Enacted</u>	<u>Change</u> <u>FY 2019/FY 2020</u>		<u>FY 2020</u> <u>Estimate</u>
		<u>Price</u>	<u>Program</u>		<u>Price</u>	<u>Program</u>	
308 Travel of Persons	188	3	-191	0	0	220	220
399 Total Travel	188	3	-191	0	0	220	220
401 DLA Energy (Fuel Products)	0	0	700	700	-5	151	846
499 Total Supplies & Materials	0	0	700	700	-5	151	846
677 DISA Telecomm Svcs - Reimbursable	2,425	46	-2,471	0	0	0	0
699 Total DWCF Purchases	2,425	46	-2,471	0	0	0	0
771 Commercial Transport	4,452	80	1,366	5,898	118	-2,421	3,595
799 Total Transportation	4,452	80	1,366	5,898	118	-2,421	3,595
912 Rental Payments to GSA (SLUC)	0	0	253	253	5	-10	248
913 Purchased Utilities (Non-Fund)	2,269	41	24	2,334	47	41	2,422
914 Purchased Communications (Non-Fund)	83	1	666	750	15	1,768	2,533
915 Rents (Non-GSA)	1,226	22	-1,248	0	0	0	0
920 Supplies & Materials (Non-Fund)	31,988	576	11,327	43,891	878	-24,188	20,581
922 Equipment Maintenance By Contract	338,326	6,090	-35,278	309,138	6,183	30,236	345,557
923 Facilities Sust, Rest, & Mod by Contract	35,760	644	-13,406	22,998	460	3,685	27,143
925 Equipment Purchases (Non-Fund)	0	0	3,448	3,448	69	-3,266	251
930 Other Depot Maintenance (Non-Fund)	13,966	251	19,377	33,594	672	44,481	78,747
932 Mgt Prof Support Svcs	1,602	29	-681	950	19	117	1,086
934 Engineering & Tech Svcs	2,137	38	327	2,502	50	900	3,452
937 Locally Purchased Fuel (Non-Fund)	1,250	-5	-1,245	0	0	0	0
984 Equipment Contracts	3,814	69	-3,842	41	1	1,804	1,846
987 Other Intra-Govt Purch	34,131	614	2,105	36,850	737	-13,250	24,337
989 Other Services	9,710	175	-826	9,059	181	-575	8,665
990 IT Contract Support Services	7,852	141	-7,926	67	1	932	1,000
999 Total Other Purchases	484,114	8,686	-26,925	465,875	9,318	42,675	517,868

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<u>OP 32 Line</u>	FY 2018	Change		FY 2019	Change		FY 2020
	<u>Actuals</u>	<u>FY 2018/FY 2019</u>		<u>Enacted</u>	<u>FY 2019/FY 2020</u>		<u>Estimate</u>
		<u>Price</u>	<u>Program</u>		<u>Price</u>	<u>Program</u>	
Total	491,179	8,815	-27,521	472,473	9,431	40,625	522,529

* OP-32 lines were realigned in FY 2020 to correct classification categories that were inaccurately reported in FY 2019 and more accurately reflect planned expenditures. The following breakout provides further traceability to OP-5 program increases and decreases to their affected OP-32 lines.

-\$18,000 thousand from line 987 Other Intra-Govt Purch was aligned to 930 Depot Maintenance to properly capture items in the right OP-32 line.

-\$15,000 thousand from line 920 Supplies & Materials (Non-Fund) was aligned to 930 Depot Maintenance to properly capture items in the right OP-32 line.

-\$7,000 thousand from line 922 Equipment Maintenance by Contract was aligned to 930 Depot Maintenance to properly capture items in the right OP-32 line.

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CONTRACT SERVICES FUNDING
(\$ in Millions)

Line	By PB/OP-32 Inflation Category Code	FY 2018	FY 2019	FY 2019	FY 2020	FY 2020
		Base & OCO	Base	OCO	Base	OCO
		<u>Actual</u>	<u>Request</u>	<u>Request</u>	<u>Request</u>	<u>Request</u>
914	Purchased Communications (Non-Fund)	1	1	0	3	0
	Total 23.1 - Communications, Utilities, and Misc. Charges	1	1	0	3	0
932	Mgmt and Professional Support Services	2	1	0	1	0
933	Studies, Analysis, and Evaluation Services	0	0		0	0
934	Engineering and Technical Services	2	3	0	3	0
	Total 25.1 - Advisory and Assistance Services	4	4	0	4	0
989	Other Contracts	10	10	0	9	0
926	Other Overseas Purchases					
	Total 25.2 - Other Services	10	10	0	9	0
987	Other Intra-Government Purchases	34	37	0	24	0
	Total 25.3 - Other Goods and Services from Federal Sources	34	37	0	24	0
923	Facility Maintenance	36	23	0	27	0
	Total 25.4 - Operation and Maintenance of Facilities	36	23	0	27	0
985	Research and Development Contracts					0
	Total 25.5 - Research and Development Contracts	0	0	0	0	0
922	Equipment Maintenance - Contract	338	309	0	346	0
930	Other Depot Maintenance (Non-Fund)	14	34	0	79	0
990	IT Contract Support Services	8	1	0	1	0
	Total 25.7 - Operation and Maintenance of Equipment	360	344	0	426	0
964	Subsistence Contracts					
	Total 25.8- Subsistence and Support of Persons	0	0	0	0	0
	Total	445	419	0	493	0

Source: Program Resources Collection Process as of 3 Jan 2019

Numbers may not add due to rounding

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Contractor Full-Time Equivalents

Line	By PB/OP-32 Inflation Category Code	FY 2018	FY 2019	FY 2019	FY 2020	FY 2020
		Base & OCO	Base	OCO	Base	OCO
		<u>Actual</u>	<u>Request</u>	<u>Request</u>	<u>Request</u>	<u>Request</u>
914	Purchased Communications (Non-Fund)	4	4	0	11	0
	Total 23.1 - Communications, Utilities and Misc. Charges	4	4	0	11	0
932	Mgmt and Professional Support Services	29	6	0	6	0
933	Studies, Analysis, and Evaluation Services				0	
934	Engineering and Technical Services	27	10		12	
	Total 25.1 - Advisory and Assistance Services	56	16	0	18	0
989	Other Contracts	31	35	0	35	0
926	Other Overseas Purchases					
	Total 25.2 - Other Services	31	35	0	35	0
987	Other Intra-Government Purchases	1	19	0	2	0
	Total 25.3 - Other Goods and Services from Federal Sources	1	19	0	2	0
923	Facility Maintenance	371	94	0	94	0
	Total 25.4 - Operation and Maintenance of Facilities	371	94	0	94	0
985	Research and Development Contracts					
	Total 25.5 - Research and Development Contracts	0	0	0	0	0
922	Equipment Maintenance - Contract	468	844	0	741	0
930	Other Depot Maintenance (Non-Fund)	23	55		130	
990	IT Contract Support Services	32	0		0	0
	Total 25.7 - Operation and Maintenance of Equipment	523	899	0	871	0
	Total	986	1,067	0	1,031	0

Source: Program Resources Collection Process as of 3 Jan 2019

Numbers may not add due to rounding

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

CONTRACT SERVICES

Defense-Wide Missile Defense Agency
Operation and Maintenance
Justification Narrative

Description of Services Financed:

Provides the following Ballistic Missile Defense (BMD) operations and maintenance support:

A. Aegis BMD. Funding provides a wide range of support activities for deployed Aegis BMD ships and Aegis Ashore facilities including Standard Missile-3 (SM-3) sustainment, BMD Aegis Weapon System (AWS) sustainment, and sustainment for Aegis Ashore sites.

The SM-3 sustainment program includes the recertification/repair of missiles, installation of software and hardware updates, demilitarization of SM-3 missiles, modeling and simulation and logistics efforts. Also provides missile first destination transportation, transportation ballistic barrier maintenance, spares replenishment and operational fleet support.

The BMDS AWS sustainment program provides technical and engineering services for in-service BMD ships and sites, along with infrastructure maintenance for BMDS platforms executing BMD test missions, to ensure the in-service BMD AWS baselines maintain the directed operational availability. BMD AWS sustainment includes: BMD Engineering Agent technical support and operational analysis for BMD units; engineering reach-back services supporting casualty correction, issues, and improvements; maintenance, certification, and delivery of BMD AWS computer program updates to the Fleet; Aegis software maintenance corrections in the common source library; test site infrastructure and maintenance; integrated logistics support of BMD unique parts and technical documentation; review and implementation of updated maintenance concepts;

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
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diminishing manufacturing sources (DMS) and obsolete materiel surveillance, identification, and resolution; maintenance actions on BMD ships and sites participating in MDA sponsored test missions.

Provides engineering services for Aegis Ashore Host Nation repairs and rework required post construction activities in support of site transition. Includes Host Nation planning yard activities to track modernization, update the Aegis Ashore technical data package to ensure core Aegis Ashore Deckhouse attributes are maintained, development of required test procedures to support on-site installation and checkout (INCO) and system operations verification testing (SOVT) and provides updates to training, warfighter technical publications, and the initial outfitting requirements for maintenance and logistics materiel.

B. Ground-Based Midcourse program reflects increase in sustainment, maintenance and material costs for the new missile field at Fort Greely, AK; 24 hours per day, 7 days per week operations and maintenance assured maintenance response capability throughout GMD sites; and increased cyber defense posture and cyber threat awareness at GMD sites. Growth additionally reflects increase in host base communications support at Fort Greely, AK to address current limited support and obsolescence issues while enhancing communications infrastructure, outside and inside plant installation support, maintenance, and repair as well as increased telephone support.

C. Ballistic Missile Defense System (BMDS) AN/TPY-2 Radars. Sustainment of 12 Army Navy/Transportable Radar Surveillance and Control-2 (AN/TPY-2) Forward-Based and Terminal High Altitude Area Defense (THAAD) configured Terminal Mode radars to include supply support, repair, maintenance, modernization, transportation, parts, storage, special tools and test equipment, recurring and delta training, technical interface, training device maintenance, engineering support, interactive electronic technical manual (IETM) updates, software user guide updates, software revision certification, and depot-level maintenance for missile defense unique equipment. Funding also provides Electronic Equipment Unit (EEU) retrofits at Letterkenny Army Depot to replace obsolete equipment, incorporate updates to upgrade servers, and enhance radar capabilities. Additionally, funding provides sustainment unique to the Missile Defense mission for the Upgraded Early Warning Radar (UEWR)/COBRA DANE Radar, which MDA sustains and operates in conjunction with the U.S. Air Force.

D. Terminal High Altitude Area Defense (THAAD). MDA is responsible for the sustainment of the THAAD missile defense unique or developmental items, while the U. S. Army is responsible for the operations and sustainment of the common items. Funding provides sustainment for all fielded THAAD Batteries, ensures

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
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THAAD assets are properly maintained and crews are trained to meet Combatant Commanders needs including:

- 1.) Field and sustainment level supply, maintenance, modernization, hazardous materials/waste disposal, and depot-level maintenance for THAAD missile defense unique equipment.
- 2.) Spares, Interceptor spares, repair parts, and maintenance capability at the location of each THAAD battery.
- 3.) Engineering support for the THAAD missile defense unique equipment.
- 4.) Deployment software support for fielded software, to include deficiency report review, error correction, incremental capability improvements, and hardware/systems interface compatibility maintenance.
- 5.) Missile transportation and handling from the missile storage location to the site of the THAAD launchers.
- 6.) IETM updates software users' guide updates, and software revision certification.
- 7.) Maintenance and upkeep for all THAAD training devices.
- 8.) Supply, maintenance and transportation support for all new equipment training, and sustainment training relating to design changes and equipment upgrades.
- 9.) Special Tools and Test Equipment for the organic depot.

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
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Reporting Limitations:

N/A

Summary of Increases/Decreases:

A. AEGIS Program funding provides: 1. Increase for Transition of non-developmental engineering site costs and Common Source Library (CSL) Software Maintenance from RDT&E funding to O&M for the lifecycle sustainment services of BMDS mission specific equipment. 2. Decrease for reduction of SM-3 Block IA/B's recertification's from 79 in FY 2019 to 32 in FY 2020 due to Navy Fleet Forces Command changes in ship and missile availability in support of fleet requirements. 3. Decrease for the reduction of rounds being returned for recertification which also generates a corresponding reduction in G-switch replacement and Third Stage Rocket Motor (TSRM) nozzle replacement repairs that are performed during missile recertification 4. Decrease for a delay in the planned FY 2018 completion of the Poland Military Construction project to stand up the Aegis Ashore Commission System which is now planned for completion in FY 2020.

B. Ground-Based Midcourse program increase provides sustainment, maintenance and material for the new missile field at Fort Greely, AK; 24 hours per day, 7 days per week operations and maintenance assured maintenance response capability throughout GMD sites; and increase cyber defense posture and cyber threat awareness at GMD sites. Growth additionally reflects increase in host base communications support at Fort Greely, AK to address current limited support and obsolescence issues while enhancing communications infrastructure, outside and inside plant installation support, maintenance, and repair as well as increased telephone support. The GM Program has fewer operational weapons system material purchases in FY 2020.

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

C. Ballistic Missile Defense Systems (BMDS) Radars program growth reflects an increase to the Cooling Equipment Unit (CEU) depot-level maintenance refurbishment schedule required to restore equipment used in high-op tempo corrosive environment.

D. THAAD program growth provides: 1. Post Deployment Software Support to sustain multiple deployed software (S/W) builds. 2. The purchase of test program sets (TPS) to establish the capability to repair and maintain depot level reparable (DLR) at Letterkenny Army Depot that were previously tested at a prime contractor facility. 3. Increased sustainment costs for the planned transition from three to four deployed OCONUS batteries. 4. Increased sustainment costs due to implementation and fielding of remote launcher capability. 5. The purchase of interceptor spare components for quick repair and return of interceptors to the field.

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MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

<u>Appropriation/Fund</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>
	<u>Actuals</u>	<u>Enacted</u>	<u>Estimate</u>
I. Management & Professional Support Services			
FFRDC Work	480	285	305
Non-FFRDC Work	<u>1,122</u>	<u>665</u>	<u>781</u>
Subtotal	1,602	950	1,086
II. Studies, Analysis & Evaluations			
FFRDC Work	0	0	0
Non-FFRDC Work	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal	0	0	0
III. Engineering & Technical Services			
FFRDC Work	1,128	1,321	1,790
Non-FFRDC Work	<u>1,009</u>	<u>1,181</u>	<u>1,662</u>
Subtotal	2,137	2,502	3,452
TOTAL			
FFRDC Work	1,608	1,606	2,095
Non-FFRDC Work	2,131	1,846	2,443
Reimbursable	0	0	0

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Explanation of Funding Changes (FY 2018 to FY 2019):

The FY 2018 to FY 2019 changes reflects less software maintenance requirements in FY 2019 based on the accelerated certifications of Aegis BMD 4.1.

Explanation of Funding Changes (FY 2019 to FY 2020):

The Ground-based Midcourse Defense Program provides an increase in Management and Support Services to perform independent assessment of GMD system manuals and processes as well as an increase in Warfighter interface and engagement assistance. Aegis BMD Program increase reflects realignment of Depot Maintenance efforts to 934 Engineering & Technical Services.

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
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Missile Defense Agency

(Dollars in Thousands)

Appropriation/Fund: RDT&E (0400)		FY 2018	FY 2019	FY 2020
1. Management & Professional Support Services				
FFRDC Work	932	15,983	7,825	9,915
Non-FFRDC Work	932	<u>482,804</u>	<u>253,019</u>	<u>320,583</u>
Sub-Total		498,787	260,844	330,498
2. Studies, Analysis & Evaluations				
FFRDC Work	933	16,343	13,020	9,140
Non-FFRDC Work	933	<u>31,410</u>	<u>25,275</u>	<u>18,557</u>
Sub-Total		47,753	38,295	27,697
3. Engineering & Technical Services				
FFRDC Work	934	46,184	58,847	2,125
Non-FFRDC Work	934	<u>60,527</u>	<u>77,121</u>	<u>100,961</u>
Sub-Total		106,711	135,968	103,086
TOTAL		653,251	435,107	461,281
FFRDC Work		78,510	79,692	21,180
Non-FFRDC Work		574,741	355,415	440,101

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MISSILE DEFENSE AGENCY
 Operation and Maintenance, Defense-Wide
 Fiscal Year (FY) 2020 President's Budget

MISSILE DEFENSE AGENCY	<u>Foreign National</u>			
	<u>US Direct Hire</u>	<u>Direct Hire</u>	<u>Indirect Hire</u>	<u>Total</u>
1. FY 2018 FTEs	0	0	0	0
2. FY 2019 FTEs	0	0	0	0
3. FY 2020 FTEs	0	0	0	0

MDA - Operation and Maintenance (O&M)	<u>Foreign National</u>			
	<u>US Direct Hire</u>	<u>Direct Hire</u>	<u>Indirect Hire</u>	<u>Total</u>
1. FY 2018 FTEs	0	0	0	0
2. FY 2019 FTEs	0	0	0	0
3. FY 2020 FTEs	0	0	0	0

MDA - Research, Development, Test and Evaluation (RDT&E)	<u>Foreign National</u>			
	<u>US Direct Hire</u>	<u>Direct Hire</u>	<u>Indirect Hire</u>	<u>Total</u>
1. FY 2018 FTEs	0	0	0	0
2. FY 2019 FTEs	0	0	0	0
3. FY 2020 FTEs	0	0	0	0

MDA - Defense Working Capital Fund (DWCF)	<u>Foreign National</u>			
	<u>US Direct Hire</u>	<u>Direct Hire</u>	<u>Indirect Hire</u>	<u>Total</u>
1. FY 2018 FTEs	0	0	0	0
2. FY 2019 FTEs	0	0	0	0
3. FY 2020 FTEs	0	0	0	0

4. SUMMARY	<u>Foreign National</u>			
	<u>US Direct Hire</u>	<u>Direct Hire</u>	<u>Indirect Hire</u>	<u>Total</u>

FY 2018

MISSILE DEFENSE AGENCY
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RDT&E Total	2,283	0	0	2,283
Direct Funded	2,283	0	0	2,283
Reimbursable Funded	0	0	0	0
Total Component	2,283	0	0	2,283
Direct Funded	2,283	0	0	2,283
Reimbursable Funded	0	0	0	0
FY 2019				
RDT&E Total	2,278	0	0	2,278
Direct Funded	2,278	0	0	2,278
Reimbursable Funded	0	0	0	0
Total Component	2,278	0	0	2,278
Direct Funded	2,278	0	0	2,278
Reimbursable Funded	0	0	0	0
FY 2020				
RDT&E Total	2,183	0	0	2,183
Direct Funded	2,183	0	0	2,183
Reimbursable Funded	0	0	0	0
Total Component	2,183	0	0	2,183
Direct Funded	2,183	0	0	2,183
Reimbursable Funded	0	0	0	0

MISSILE DEFENSE AGENCY
Operation and Maintenance, Defense-Wide
Fiscal Year (FY) 2020 President's Budget

5. SUMMARY OF CHANGES

Research, Development, Test and Evaluation (RDT&E)

Change from FY 2018 to FY 2019:

MDA's total reflects the continuation of the 20% Management HQ Funding and OSD Comptroller Issue No: MP-015 Reduction for Travel Efficiencies through 2019. MDA's phased implementation will continue through FY 2019, consistent with the plan approved by the office of the Deputy Management Officer (DCMO). RMD 700A2 Issue OPS-014 Financial Improvement and Audit Readiness Manpower Reallocation. Action transfers 1 civilian FTE with funding from WHS to MDA to meet audit readiness goals within established timelines.

Change from FY 2019 to FY 2020:

MDA's direct RDT&E funded FTE reflects the continued implementation of the Management Headquarter Activity (MHA) reductions. MDA's phased implementation will continue through FY 2020, consistent with the plan approved by the office of the Deputy Management Officer (DCMO).

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Missile Defense Agency Depot Maintenance Program
(\$ in Thousands)

	Method of Accomplishment	Weapon System	FY 2018	FY 2019	FY 2020
Operation and Maintenance Funding					
	Contractor Logistics Support (CLS)	AN/TPY-2 Radar	59,108	55,246	59,526
		Ballistic Missile Defense	22,012	19,763	28,497
		Standard Missile-3	35,564	37,711	26,878
		THAAD	11,709	22,915	28,987
	Contractor Logistics Support (CLS) Total		128,393	135,635	143,888
	Interim Contract Support (ICS)	THAAD	-	-	-
	Interim Contract Support (ICS) Total		-	-	-
	Inter-Service	Standard Missile-3	278	259	180
		THAAD	165	6,180	9,170
	Inter-Service Total		443	6,439	9,350
	Organic	Ballistic Missile Defense	5,305	5,541	7,990
		Standard Missile-3	5,481	10,685	9,622
		THAAD	2,135	84	3,428
	Organic Total		12,921	16,310	21,040
		THAAD	16,600	12,563	10,299
	Other Contract Total		16,600	12,563	10,299
	Total Operation and Maintenance Funding		158,357	170,947	184,577
Procurement Funding					
	Interim Contractor Support (ICS)	THAAD	-	-	-
	Interim Contractor Support (ICS) Total		-	-	-
	Other Contract	AN/TPY-2 Radar	947	5,397	3,296
	Other Contract Total		947	5,397	3,296
	Total Procurement Funding		947	5,397	3,296
Research, Development, Test and Evaluation Funding					
	Contractor Logistics Support (CLS)	Ballistic Missile Defense	489	-	-
	Contractor Logistics Support (CLS) Total		489	-	-
	Organic	Ballistic Missile Defense	150	-	-
	Organic Total		150	-	-
	Other Contract	AN/TPY-2 Radar	80,089	81,070	81,590
		THAAD	-	-	-
	Other Contract Total		80,089	81,070	81,590
	Total Research, Development, Test and Evaluation Funding		80,727	81,070	81,590
	Total MDA Depot Maintenance Program		240,031	257,414	269,463

NOTE: The funding in each fiscal year represents both the required and funded amounts for that program.

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Missile Defense Agency

Fiscal Year 2020

President's Budget Submittal

Military Construction Exhibit



March 2019

**MISSILE DEFENSE AGENCY
FY 2020 MILITARY CONSTRUCTION
PRESIDENT'S BUDGET SUBMITTAL
DESCRIPTIVE SUMMARIES**

(\$ in Thousands)

<u>Program</u>	<u>Authorization</u>	<u>Appropriation</u>
Major Construction	0	0
Unspecified Minor Construction	10,000	10,000
MILCON Planning & Design	<u>35,472</u>	<u>35,472</u>
TOTAL MILITARY CONSTRUCTION	45,472	45,472

**MISSILE DEFENSE AGENCY
 FY 2020 MILITARY CONSTRUCTION
 PROJECT SUMMARY
 BY LOCATION**

(\$ in Thousands)

<u>State/Installation/Project</u>	<u>Auth Request</u>	<u>Approp Request</u>	<u>New/Current Mission</u>
Major Construction	0	0	
Unspecified Minor Construction	10,000	10,000	
MILCON Planning and Design	<u>35,472</u>	<u>35,472</u>	
TOTAL MILITARY CONSTRUCTION	45,472	45,472	

1. COMPONENT MDA	FY 2020 MILITARY CONSTRUCTION PROJECT DATA			2. DATE Jan 2019	
3. INSTALLATION AND LOCATION Various Worldwide Locations		4. PROJECT TITLE Unspecified Minor Construction			
5. PROGRAM ELEMENT N/A	6. CATEGORY CODE N/A	7. PROJECT NUMBER N/A	8. PROJECT COST (\$000) 10,000		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Unspecified Minor Construction		LS			10,000
SUBTOTAL CONTINGENCY PERCENT (0.0%) ESTIMATED CONTRACT COST SUPERVISION, INSPECTION & OVERHEAD (0.0%) TOTAL REQUEST TOTAL REQUEST (ROUNDED) INSTALLED EQPT-OTHER APPROPRIATIONS					10,000 0 10,000 0 10,000 10,000 (0)
10. DESCRIPTION OF PROPOSED CONSTRUCTION: Provide a lump sum amount for unspecified construction projects, not otherwise authorized by law, including normal construction, alteration or conversion of permanent or temporary facilities, in accordance with 10 USC Section 2805 as amended by the FY 2018 National Defense Authorization Act.					
11. REQUIREMENT: As required <u>REQUIREMENT:</u> New and expanded facilities supporting MDA missions with a cost up to \$6,000,000 adjusted for location (not to exceed \$10,000,000) within the U.S. and territories, and up to \$6,000,000 elsewhere. These funds provide MDA the capability to react in FY 2020 to requirements for construction, alteration, or modification of facilities resulting from unforeseen situations affecting mission performance or safety of life or property. Included would be projects to support mission critical research and development requirements of the Ballistic Missile Defense System. All required NEPA and/or EO 12114 analyses will be completed prior to the start of construction for each unspecified construction project.					

1. COMPONENT MDA	FY 2020 MILITARY CONSTRUCTION PROJECT DATA			2. DATE Jan 2019	
3. INSTALLATION AND LOCATION Various Worldwide Locations		4. PROJECT TITLE Planning and Design			
5. PROGRAM ELEMENT N/A	6. CATEGORY CODE N/A	7. PROJECT NUMBER N/A	8. PROJECT COST (\$000) 35,472		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Planning and Design		LS			35,472
SUBTOTAL					35,472
CONTINGENCY PERCENT (0.0%)					0
ESTMATED CONTRACT COST					35,472
SUPERVISION, INSPECTION & OVERHEAD (0.0%)					0
TOTAL REQUEST					35,472
TOTAL REQUEST (ROUNDED)					35,472
INSTALLED EQPT-OTHER APPROPRIATIONS					(0)
10. DESCRIPTION OF PROPOSED CONSTRUCTION: The funds requested will be used to provide financing for architectural and engineering services and construction design of Missile Defense Agency (MDA) Military Construction projects.					
11. REQUIREMENT: As required <u>REQUIREMENT:</u> These planning and design funds are required to initiate and complete design of facilities in the MDA military construction program including unspecified minor construction projects which are anticipated to arise during FY 2020, and accomplish planning and design for future projects supporting the Ballistic Missile Defense System (BMDS) with a long lead-time to be included in subsequent MDA Military Construction programs. The amount of planning and design funds in FY 2020 is due to five major military construction projects planned in the FYDP: <ul style="list-style-type: none"> • FY 2021 Redundant Communications Facility, Fort Greely, Alaska that will construct a new facility to provide a redundant Ground-Based Midcourse Defense fire control and communications capability on the Missile Defense Complex, • FY 2021 Homeland Defense Radar - Hawaii (HDR-H), Phase 1 project that will construct a new HDR System Complex on the island of Oahu, Hawaii consisting of a Mission Control Facility in Phase 1, • FY 2022 Homeland Defense Radar - Hawaii (HDR-H), Phase 2 project that will construct a new HDR System Complex on the island of Oahu, Hawaii consisting of a Mission Power Plant in Phase 2, • FY 2021 Hawaii In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT) project that will construct a new IDT capability co-located with HDR-H, and • FY 2022 Consolidated Test Center, Phase 1 facility at Redstone Arsenal, Alabama that will construct a state-of-the-art test center providing a more operationally realistic, secure, and efficient test infrastructure environment to support the next generation of BMDS Hardware-in-the-loop testing. 					

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD07 / THAAD
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ID Code (A=Service Ready, B=Not Service Ready): B	Program Elements for Code B Items: 0604876C, 0603881C	Other Related Program Elements: 0604876C, 0603881C
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	276	109	96	37	-	37	28	21	28	29	-	624
Gross/Weapon System Cost (<i>\$ in Millions</i>)	4,164.497	1,125.732	1,014.068	425.863	-	425.863	430.719	381.628	417.431	432.831	-	8,392.769
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	4,164.497	1,125.732	1,014.068	425.863	-	425.863	430.719	381.628	417.431	432.831	-	8,392.769
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	4,164.497	1,125.732	1,014.068	425.863	-	425.863	430.719	381.628	417.431	432.831	-	8,392.769

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	23.016	9.169	9.647	9.426	-	9.426	12.142	12.142	12.314	12.314	Continuing	Continuing
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	15.089	10.328	10.563	11.510	-	11.510	15.383	18.173	14.908	14.925	-	13.450

Description:

Terminal High Altitude Area Defense (THAAD) is an element of the Terminal Defense Segment (TDS) of the Ballistic Missile Defense System (BMDS). THAAD enhances the TDS by deepening, complementing, and extending the BMDS battlespace and capability to engage ballistic targets in the late mid-course and terminal phases of their trajectory. THAAD Army Navy / Transportable Radar Surveillance - Model 2 (AN/TPY-2) is a surveillance and targeting sensor providing data to the THAAD system to execute intercept missions. The THAAD system, in conjunction with the fielded Phased Array Tracking Radar to Intercept on Target (PATRIOT) system, provides the TDS for the Missile Defense Agency (MDA) objective of enhancing the BMDS capability. Five major components (Interceptors, Launchers, AN/TPY-2 Radar, THAAD Fire Control and Communication (TFCC) Tactical Station Groups (TSG), and Peculiar Support Equipment including Missile Round Pallet Transportable) comprise the THAAD system.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD07 / THAAD
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ID Code (A=Service Ready, B=Not Service Ready): B	Program Elements for Code B Items: 0604876C, 0603881C	Other Related Program Elements: 0604876C, 0603881C
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Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	THAAD	P-5a, P-21	B		276 / 4,164.497	109 / 1,125.732	96 / 1,014.068	37 / 425.863	- / -	37 / 425.863
P-40	Total Gross/Weapon System Cost				276 / 4,164.497	109 / 1,125.732	96 / 1,014.068	37 / 425.863	- / -	37 / 425.863

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
 The FY 2020 budget decrease is primarily due to a reduction in the THAAD Interceptor procurement quantity from 96 in FY 2019 to 37 in FY 2020.

The FY 2020 budget request includes 37 THAAD Interceptors, the THAAD Stockpile Reliability Program, obsolescence mitigation efforts, production and training support, as well as the procurement of necessary tooling and equipment for the THAAD stockpile reliability and recertification program needed to maintain THAAD interceptors in warfighter inventory.

In FY 2020 MDA will continue a "synergy" lot buy approach to THAAD Interceptor purchases. This approach entails awarding a contract that includes an option for the following fiscal year funding. By utilizing this approach, MDA will achieve savings in material costs in multiple fiscal years. This will result in a higher Interceptor quantity buy at a lower average unit price than if buys were not combined. Depending on outcome of the synergy buy, THAAD plans to buy to budget such that potentially more interceptors or their enabling hardware items as required could be procured.

Two (2) of the seven (7) THAAD Batteries delivered to date were funded with Research Development Test and Evaluation (RDT&E) in Program Element (PE) 0603881C, thus not included in the costs above.

"Procurement Quantity" and "Flyaway Unit Cost" above represent interceptors only, but the "Net Procurement" cost above includes the costs of all hardware. Prior FYs funding included procurement of ground components, which affected the "Gross Weapon System Unit Cost".

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD

ID Code (A=Service Ready, B=Not Service Ready) : B	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	276	109	96	37	-	37
Gross/Weapon System Cost (\$ in Millions)	4,164.497	1,125.732	1,014.068	425.863	-	425.863
Less PY Advance Procurement (\$ in Millions)	0.000	0.000	0.000	-	-	-
Net Procurement (P-1) (\$ in Millions)	4,164.497	1,125.732	1,014.068	425.863	-	425.863
Plus CY Advance Procurement (\$ in Millions)	0.000	0.000	0.000	-	-	-
Total Obligation Authority (\$ in Millions)	4,164.497	1,125.732	1,014.068	425.863	-	425.863

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	15.089	10.328	10.563	11.510	-	11.510

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware Cost																		
Recurring Cost																		
Interceptor ^(†)	10.661	276	2,942.384	9.169	109	999.425	9.647	96	926.123	9.426	37	348.753	-	-	-	9.426	37	348.753
Launcher ^(†)	8.110	36	291.977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Support Equipment	20.453	8	163.627	69.864	1	69.864	-	-	-	-	-	-	-	-	-	-	-	-
TFCC Tactical Station Group ^(†)	10.522	8	84.179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Recurring Cost</i>	-	-	3,482.167	-	-	1,069.289	-	-	926.123	-	-	348.753	-	-	-	-	-	348.753
<i>Subtotal: Hardware Cost</i>	-	-	3,482.167	-	-	1,069.289	-	-	926.123	-	-	348.753	-	-	-	-	-	348.753
Support Cost																		
Obsolescence and Modifications	35.363	5	176.816	21.989	1	21.989	30.920	1	30.920	25.151	1	25.151	-	-	-	25.151	1	25.151
Production Support & Testing	61.833	6	370.998	12.293	1	12.293	19.225	1	19.225	44.549	1	44.549	-	-	-	44.549	1	44.549
Training	22.419	6	134.516	18.021	1	18.021	-	-	-	7.410	1	7.410	-	-	-	7.410	1	7.410
USFK JEON	-	-	-	4.140	1	4.140	37.800	1	37.800	-	-	-	-	-	-	-	-	-
<i>Subtotal: Support Cost</i>	-	-	682.330	-	-	56.443	-	-	87.945	-	-	77.110	-	-	-	-	-	77.110
Gross/Weapon System Cost	15.089	276	4,164.497	10.328	109	1,125.732	10.563	96	1,014.068	11.510	37	425.863	-	-	-	11.510	37	425.863

Remarks:

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
ID Code (A=Service Ready, B=Not Service Ready) : B	MDAP/MAIS Code:	
<p>"Procurement Quantity" above represents interceptors only, but the "Net Procurement" cost above includes the costs of all hardware. Prior FYs funding includes procurement of ground components, which affects the "Gross Weapon System Unit Cost". Support Equipment captures miscellaneous items such as THAAD Missile Round Pallet-Transportable (MRP-T), THAAD Active Leak Sensor System (TALSS), and Battery Support Center (BSC) that support the THAAD Batteries and varies from year to year.</p> <p>The decrease from FY 2019 to FY 2020 reflects a reduction in THAAD interceptor quantity from 96 in FY 2019 to 37 in FY 2020.</p> <p>The increase in the Production Support & Testing from FY 2019 to FY 2020 procures equipment required for Stockpile Reliability Testing. As Interceptor production quantities increase, the existing production line, operating at annual capacity levels, cannot serve the dual-purpose of both final Interceptor integration and Interceptor disassembly for stockpile reliability testing purposes. Prime Contractor is making a capital investment for additional production space. This funding will procure test equipment and production fixtures for the new Stockpile Reliability Test Interceptor assembly/disassembly line. In addition, this equipment provides interceptor recertification and enables production and surge operations if required.</p> <p>The increase in the Training from FY 2019 to FY 2020 provides procurement of THAAD Skills Trainer to train enhanced operators/maintainers on THAAD hardware. Without the THAAD Skills Trainer, the US Army cannot efficiently train new THAAD soldiers.</p> <p>Obsolescence encompasses mitigation activities that protect the system design and ensure a producible technical data package. This preserves an affordable future product cost within an acceptable production schedule. Examples of mitigation activities include component replacement parts, materials, qualification, alternative source/parts qualification, and piece part/material bridge buys to support subsequent years' production lots.</p> <p>(t) indicates the presence of a P-5a</p>		

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty (Each)	Unit Cost (\$ M)	Specs Avail Now?	Date Revision Available	RFP Issue Date
Interceptor - Lot 1 ^(†)		2010	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Mar 2011	Jul 2012	26	14.480	Y		Oct 2009
Interceptor - Lot 2 ^(†)		2011	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Mar 2011	Jul 2013	22	12.100	N		Oct 2009
Interceptor - Lot 4 ^(†)		2012	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Aug 2012	Jun 2015	46	11.022	N		Aug 2011
Interceptor - Lot 5 ^(†)		2013	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Sep 2013	Jul 2017	34	11.022	N		Aug 2011
Interceptor - Lot 6 ^(†)		2014	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Dec 2013	Mar 2018	27	11.022	N		Jun 2013
Interceptor - Lot 7 ^(†)		2015	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Dec 2015	Aug 2018	38	10.100	N		Mar 2014
Interceptor - Lot 8 ^(†)		2016	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Dec 2015	Apr 2019	36	10.100	N		Apr 2015
Interceptor - Lot 9 ^(†)		2017	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Mar 2017	Jan 2020	47	9.185	N		May 2016
Interceptor - Lot 10 ^(†)		2018	Lockheed Martin / Troy, AL	SS / FPIF	MDA, Huntsville, AL	Dec 2017	Jun 2020	109	9.169	N		Dec 2016
Launcher - Lot 1 ^(†)		2010	Lockheed Martin / Camden, AR	SS / FFP	MDA, Huntsville, AL	May 2011	Apr 2013	6	9.170	Y		Oct 2009
Launcher - Lot 3 ^(†)		2011	Lockheed Martin / Camden, AR	SS / FFP	MDA, Huntsville, AL	Jul 2012	May 2014	6	9.130	Y		Aug 2011
Launcher - Lot 2 ^(†)		2011	Lockheed Martin / Camden, AR	SS / FFP	MDA, Huntsville, AL	May 2011	Oct 2013	6	9.130	Y		Oct 2009
Launcher - Lot 4 ^(†)		2012	Lockheed Martin / Camden, AR	SS / FFP	MDA, Huntsville, AL	Jul 2012	Nov 2014	6	7.490	Y		Aug 2011
Launcher - Lot 6 ^(†)		2014	Lockheed Martin / Camden, AR	SS / FFP	MDA, Huntsville, AL	Aug 2014	Mar 2016	12	9.050	Y		Jun 2013
TFCC Tactical Station Group - Lot 2 ^(†)		2011	Lockheed Martin / Camden, AR	SS / FFP	MDA, Huntsville, AL	Mar 2011	May 2013	4	10.100	Y		Oct 2009
TFCC Tactical Station Group - Lot 3 ^(†)		2011	Lockheed Martin / Camden, AR	SS / FFP	MDA, Huntsville, AL	Jul 2012	Aug 2014	2	10.100	Y		Aug 2011
TFCC Tactical Station Group - Lot 4 ^(†)		2012	Lockheed Martin / Camden, AR	SS / FFP	MDA, Huntsville, AL	Jul 2012	Oct 2014	2	9.260	Y		Aug 2011

^(†) indicates the presence of a P-21

Remarks:

- Lot 3 Interceptors were removed due to a Congressional Mark in FY 2011; - Lot numbers relate to groupings in fiscal years and no Launcher or Tactical Fire Control and Communication (TFCC) Tactical Station Groups (TSGs) were scheduled for procurement in FY 2013, therefore Lot 5 is an interceptor only Lot; - Delivery of Battery 3 completed in FY 2013; - Delivery of Battery 4 completed in FY 2014; - Delivery of Battery 5 completed in FY 2015; - Delivery of Battery 6 completed in FY 2016; - Delivery of Battery 7 completed in FY 2017; - Concurrent with the Lot 4, 5, and 6 (FY 2012-FY 2014) U.S. procurements, MDA THAAD is executing a Foreign Military Sales (FMS) Case for two (2) Batteries and 192 Interceptors. The magnitude of the USG and FMS combined buy reduced the unit price for those Lots, and an overlap in period of performance with FMS interceptors also benefited the unit price for Lots 7 and 8 (FY 2015 and FY 2016).

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency Date: March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17 P-1 Line Item Number / Title: MD07 / THAAD Item Number / Title [DODIC]: THAAD

Cost Elements <i>(Units in Each)</i>					Fiscal Year 2011													Fiscal Year 2012													BALANCE			
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2010	BAL DUE AS OF 1 OCT	Calendar Year 2011													Calendar Year 2012														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P				
Interceptor - Lot 1																																		
	1	2010	MDA	26	0	26																								1	-	-	25	
Interceptor - Lot 2																																		
	2	2011	MDA	22	0	22																										22		
Interceptor - Lot 4																																		
	3	2012	MDA	46	0	46																										46		
Interceptor - Lot 5																																		
	4	2013	MDA	34	0	34																										34		
Interceptor - Lot 6																																		
	5	2014	MDA	27	0	27																										27		
Interceptor - Lot 7																																		
	6	2015	MDA	38	0	38																										38		
Interceptor - Lot 8																																		
	6	2016	MDA	36	0	36																										36		
Interceptor - Lot 9																																		
	6	2017	MDA	47	0	47																										47		
Interceptor - Lot 10																																		
	6	2018	MDA	109	0	109																										109		
Launcher - Lot 1																																		
	7	2010	MDA	6	0	6									A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6		
Launcher - Lot 3																																		
	8	2011	MDA	6	0	6																								A	-	-	6	
Launcher - Lot 2																																		
	9	2011	MDA	6	0	6									A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6		
Launcher - Lot 4																																		
	10	2012	MDA	6	0	6																							A	-	-	6		
Launcher - Lot 6																																		
	11	2014	MDA	12	0	12																										12		
TFCC Tactical Station Group - Lot 2																																		
	12	2011	MDA	4	0	4									A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4		
TFCC Tactical Station Group - Lot 3																																		
	13	2011	MDA	2	0	2																							A	-	-	2		
TFCC Tactical Station Group - Lot 4																																		
							O	N	D	J	F	M	A	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S					
							C	O	E	A	E	A	P	A	U	E	C	O	O	D	A	E	A	A	A	U	U	A	S					
							T	V	C	N	B	R	R	Y	N	L	G	P	T	V	C	N	B	R	P	Y	N	L	G	P				

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements <i>(Units in Each)</i>					Fiscal Year 2013													Fiscal Year 2014													BALANCE			
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2012	BAL DUE AS OF 1 OCT	Calendar Year 2013													Calendar Year 2014														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P				
Interceptor - Lot 1																																		
	1	2010	MDA	26	1	25	-	-	-	-	-	-	3	6	6	7	3																	0
Interceptor - Lot 2																																		
	2	2011	MDA	22	0	22	-	-	-	-	-	-	-	-	-	4	4	4	3	3	3	-	-	-	1									0
Interceptor - Lot 4																																		
	3	2012	MDA	46	0	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	
Interceptor - Lot 5																																		
	4	2013	MDA	34	0	34																											34	
Interceptor - Lot 6																																		
	5	2014	MDA	27	0	27																											27	
Interceptor - Lot 7																																		
	6	2015	MDA	38	0	38																											38	
Interceptor - Lot 8																																		
	6	2016	MDA	36	0	36																											36	
Interceptor - Lot 9																																		
	6	2017	MDA	47	0	47																											47	
Interceptor - Lot 10																																		
	6	2018	MDA	109	0	109																											109	
Launcher - Lot 1																																		
	7	2010	MDA	6	0	6	-	-	-	-	-	-	1	2	-	-	3																0	
Launcher - Lot 3																																		
	8	2011	MDA	6	0	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1
Launcher - Lot 2																																		
	9	2011	MDA	6	0	6	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1									0	
Launcher - Lot 4																																		
	10	2012	MDA	6	0	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	
Launcher - Lot 6																																		
	11	2014	MDA	12	0	12																												12
TFCC Tactical Station Group - Lot 2																																		
	12	2011	MDA	4	0	4	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
TFCC Tactical Station Group - Lot 3																																		
	13	2011	MDA	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0	
TFCC Tactical Station Group - Lot 4																																		
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P				

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2013												Fiscal Year 2014												BALANCE					
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2012	BAL DUE AS OF 1 OCT	Calendar Year 2013												Calendar Year 2014																
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P				
	14	2012	MDA	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2015														Fiscal Year 2016														BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2014	BAL DUE AS OF 1 OCT	Calendar Year 2015														Calendar Year 2016														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Interceptor - Lot 1																																			
	1	2010	MDA	26	26	0																												0	
Interceptor - Lot 2																																			
	2	2011	MDA	22	22	0																												0	
Interceptor - Lot 4																																			
	3	2012	MDA	46	0	46	-	-	-	-	-	-	-	-	3	-	-	-	-	-	2	7	-	-	-	-	-	-	-	12	-	-	-	22	
Interceptor - Lot 5																																			
	4	2013	MDA	34	0	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34		
Interceptor - Lot 6																																			
	5	2014	MDA	27	0	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27		
Interceptor - Lot 7																																			
	6	2015	MDA	38	0	38																											38		
Interceptor - Lot 8																																			
	6	2016	MDA	36	0	36																											36		
Interceptor - Lot 9																																			
	6	2017	MDA	47	0	47																											47		
Interceptor - Lot 10																																			
	6	2018	MDA	109	0	109																											109		
Launcher - Lot 1																																			
	7	2010	MDA	6	6	0																											0		
Launcher - Lot 3																																			
	8	2011	MDA	6	5	1	1																										0		
Launcher - Lot 2																																			
	9	2011	MDA	6	6	0																											0		
Launcher - Lot 4																																			
	10	2012	MDA	6	0	6	-	1	1	1	1	1	1																				0		
Launcher - Lot 6																																			
	11	2014	MDA	12	0	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	1	1	1	2	1	2	
TFCC Tactical Station Group - Lot 2																																			
	12	2011	MDA	4	4	0																											0		
TFCC Tactical Station Group - Lot 3																																			
	13	2011	MDA	2	2	0																											0		
TFCC Tactical Station Group - Lot 4																																			
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency	Date: March 2019
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Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2015														Fiscal Year 2016														BALANCE			
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2014	BAL DUE AS OF 1 OCT	Calendar Year 2015														Calendar Year 2016																
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P							
	14	2012	MDA	2	0	2	1	1																												0	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2017														Fiscal Year 2018												BALANCE						
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEP T P R I O R T O 1 O C T 2 0 1 6	BAL D U E A S O F 1 O C T	Calendar Year 2017														Calendar Year 2018																	
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P								
Interceptor - Lot 1																																						
	1	2010	MDA	26	26	0																							0									
Interceptor - Lot 2																																						
	2	2011	MDA	22	22	0																							0									
Interceptor - Lot 4																																						
	3	2012	MDA	46	24	22	-	-	-	-	-	-	2	3	9	8													0									
Interceptor - Lot 5																																						
	4	2013	MDA	34	0	34	-	-	-	-	-	-	-	-	4	8	7	1	-	4	-	7	3					0										
Interceptor - Lot 6																																						
	5	2014	MDA	27	0	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	12	6	1			0										
Interceptor - Lot 7																																						
	6	2015	MDA	38	0	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	6	22									
Interceptor - Lot 8																																						
	6	2016	MDA	36	0	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36										
Interceptor - Lot 9																																						
	6	2017	MDA	47	0	47							A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47										
Interceptor - Lot 10																																						
	6	2018	MDA	109	0	109																					A	-	-	-	-	-	-	-	-	-	-	109
Launcher - Lot 1																																						
	7	2010	MDA	6	6	0																							0									
Launcher - Lot 3																																						
	8	2011	MDA	6	6	0																							0									
Launcher - Lot 2																																						
	9	2011	MDA	6	6	0																							0									
Launcher - Lot 4																																						
	10	2012	MDA	6	6	0																							0									
Launcher - Lot 6																																						
	11	2014	MDA	12	10	2	1	1																					0									
TFCC Tactical Station Group - Lot 2																																						
	12	2011	MDA	4	4	0																							0									
TFCC Tactical Station Group - Lot 3																																						
	13	2011	MDA	2	2	0																							0									
TFCC Tactical Station Group - Lot 4																																						
							O	N	D	J	F	M	A	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S									
							C	O	E	A	E	A	A	U	U	A	E	C	O	V	E	A	E	A	A	U	U	A	S									
							T	V	C	N	B	R	P	Y	N	L	G	P	T	V	C	N	B	R	P	Y	N	L	U	G	P							

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency	Date: March 2019
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Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2017												Fiscal Year 2018												BALANCE	
O C C O	M F R #	F Y	S E R V I C E	P R O C Q T Y	A C C E P T P R I O R T O 1 O C T 2 0 1 6	B A L D U E A S O F 1 O C T	Calendar Year 2017												Calendar Year 2018												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
	14	2012	MDA	2	2	0																									
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2019																Fiscal Year 2020												BALANCE	
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2018	BAL DUE AS OF 1 OCT	Calendar Year 2019																Calendar Year 2020												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Interceptor - Lot 1																																			
	1	2010	MDA	26	26	0																							0						
Interceptor - Lot 2																																			
	2	2011	MDA	22	22	0																							0						
Interceptor - Lot 4																																			
	3	2012	MDA	46	46	0																							0						
Interceptor - Lot 5																																			
	4	2013	MDA	34	34	0																							0						
Interceptor - Lot 6																																			
	5	2014	MDA	27	27	0																							0						
Interceptor - Lot 7																																			
	6	2015	MDA	38	16	22	-	5	5	4	4	4																	0						
Interceptor - Lot 8																																			
	6	2016	MDA	36	0	36	-	-	-	-	-	-	4	4	4	4	4	3	4	4	5								0						
Interceptor - Lot 9																																			
	6	2017	MDA	47	0	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	8	8	8	8	7			0						
Interceptor - Lot 10																																			
	6	2018	MDA	109	0	109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	8	8	8	84					
Launcher - Lot 1																																			
	7	2010	MDA	6	6	0																							0						
Launcher - Lot 3																																			
	8	2011	MDA	6	6	0																							0						
Launcher - Lot 2																																			
	9	2011	MDA	6	6	0																							0						
Launcher - Lot 4																																			
	10	2012	MDA	6	6	0																							0						
Launcher - Lot 6																																			
	11	2014	MDA	12	12	0																							0						
TFCC Tactical Station Group - Lot 2																																			
	12	2011	MDA	4	4	0																							0						
TFCC Tactical Station Group - Lot 3																																			
	13	2011	MDA	2	2	0																							0						
TFCC Tactical Station Group - Lot 4																																			
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2021													Fiscal Year 2022													BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2020	BAL DUE AS OF 1 OCT	Calendar Year 2021													Calendar Year 2022													
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			
Interceptor - Lot 1																																	
	1	2010	MDA	26	26	0																							0				
Interceptor - Lot 2																																	
	2	2011	MDA	22	22	0																							0				
Interceptor - Lot 4																																	
	3	2012	MDA	46	46	0																							0				
Interceptor - Lot 5																																	
	4	2013	MDA	34	34	0																							0				
Interceptor - Lot 6																																	
	5	2014	MDA	27	27	0																							0				
Interceptor - Lot 7																																	
	6	2015	MDA	38	38	0																							0				
Interceptor - Lot 8																																	
	6	2016	MDA	36	36	0																							0				
Interceptor - Lot 9																																	
	6	2017	MDA	47	47	0																							0				
Interceptor - Lot 10																																	
	6	2018	MDA	109	25	84	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	4	0			
Launcher - Lot 1																																	
	7	2010	MDA	6	6	0																							0				
Launcher - Lot 3																																	
	8	2011	MDA	6	6	0																							0				
Launcher - Lot 2																																	
	9	2011	MDA	6	6	0																							0				
Launcher - Lot 4																																	
	10	2012	MDA	6	6	0																							0				
Launcher - Lot 6																																	
	11	2014	MDA	12	12	0																							0				
TFCC Tactical Station Group - Lot 2																																	
	12	2011	MDA	4	4	0																							0				
TFCC Tactical Station Group - Lot 3																																	
	13	2011	MDA	2	2	0																							0				
TFCC Tactical Station Group - Lot 4																																	
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17		P-1 Line Item Number / Title: MD07 / THAAD
		Item Number / Title [DODIC]: THAAD

MFR Ref #	Manufacturer Name - Location	Production Rates (Each / Month)			Procurement Leadtime (Months)							
		MSR For 2020	1-8-5 For 2020	MAX For 2020	Initial				Reorder			
					ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1	ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1
1	Lockheed Martin - Troy, AL	1	4	8	6	6	16	22	6	4	27	31
2	Lockheed Martin - Troy, AL	1	4	8	6	6	28	34	6	4	27	31
3	Lockheed Martin - Troy, AL	1	4	8	6	11	36	47	6	11	36	47
4	Lockheed Martin - Troy, AL	1	4	8	6	12	37	49	6	12	37	49
5	Lockheed Martin - Troy, AL	1	4	8	6	3	43	46	6	3	43	46
6	Lockheed Martin - Troy, AL	1	4	8	6	12	31	43	6	12	31	43
7	Lockheed Martin - Camden, AR	1	1	3	6	8	23	31	6	4	21	25
8	Lockheed Martin - Camden, AR	1	1	2	6	10	22	32	6	4	21	25
9	Lockheed Martin - Camden, AR	1	1	2	6	8	29	37	6	4	21	25
10	Lockheed Martin - Camden, AR	1	1	2	6	10	28	38	6	3	21	24
11	Lockheed Martin - Camden, AR	1	1	2	6	6	22	28	6	4	21	25
12	Lockheed Martin - Camden, AR	1	2	2	6	6	26	32	6	4	24	28
13	Lockheed Martin - Camden, AR	1	1	1	6	10	25	35	6	4	24	28
14	Lockheed Martin - Camden, AR	1	1	1	6	10	27	37	6	3	24	27

Remarks:

- Max Production rate is 8 at normal capacity.
- FMS deliveries of approximately 4 per month from December 2015 to October 2019 are not included.
- In August 2016, interceptor deliveries were paused in order to resolve a cable connector sub-assembly issue. During this time however, production of other interceptor sub-assemblies continued. Interceptor production resumed in November 2016, and associated deliveries resumed in April 2017. Lockheed Martin worked extended work days and additional shifts in order to surge deliveries through September 2018 in order to complete interceptor deliveries in accordance with current contract requirements.
- Manufacturing lead times can vary due to factors such as managing multiple lot buys concurrently to achieve price discounts, increasing the lead time for the second awarded lot buy.
- A Lot 4 Interceptor mission computer static random access memory failure, root cause analysis, corrective action, and incorporation of leap second software update resulted in a seven (7) month production delay from November 2014 to June 2015.

"A" in the Delivery Schedule indicates the Contract Award Date.

Note: Due to space limitations, quantities in the Exhibit P-21 delivery calendar are truncated and rounded based on the maximum quantity in the calendar as follows. If the maximum quantity is less than or equal to than 9,999, all quantities are shown as each. If the maximum quantity is between 10,000 and 999,999 all quantities are shown in thousands. If the maximum quantity is between 1,000,000 and 999,999,999 all quantities are shown in millions (rounded to the nearest thousand). If the maximum quantity is equal or greater than 1,000,000,000 all quantities are shown in billions (rounded to the nearest million).

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD07 / THAAD	Item Number / Title [DODIC]: THAAD

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: 0603882C	Other Related Program Elements: 0603882C
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	0	10	16	-	-	-	4	8	8	10	Continuing	Continuing
Gross/Weapon System Cost (<i>\$ in Millions</i>)	0.000	227.000	505.600	124.471	-	124.471	209.584	532.341	535.718	257.686	Continuing	Continuing
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	47.000	88.000	115.000	-	115.000	-	113.882	114.516	45.799	Continuing	Continuing
Net Procurement (P-1) (<i>\$ in Millions</i>)	0.000	180.000	417.600	9.471	-	9.471	209.584	418.459	421.202	211.887	Continuing	Continuing
Plus CY Advance Procurement (<i>\$ in Millions</i>)	47.000	88.000	115.000	-	-	-	113.882	114.516	45.799	32.776	Continuing	Continuing
Total Obligation Authority (<i>\$ in Millions</i>)	47.000	268.000	532.600	9.471	-	9.471	323.466	532.975	467.001	244.663	Continuing	Continuing

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	0.000	22.700	31.600	-	-	-	52.396	66.543	66.965	25.769	Continuing	Continuing

Description:

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). Each GBI delivers a single kill vehicle 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.

The Missile Defense Agency (MDA) will expand the number of operationally deployed GBIs from 44 to 64. To accomplish this, MDA will build a new 20 silo Missile Field #4 at Fort Greely, Alaska as well as procure 20 additional Ground Based Interceptors with Configuration 2 boosters and Redesigned Kill Vehicles for the warfighter to defeat developing threats. The procurement funded efforts in MD08 include 20 Missile Field #4 silo interface vaults and silos, 2 Missile Field #1 silo interface vaults and silos and 20 All Up Round GBIs and Redesigned Kill Vehicles. The RKV-equipped GBI will incorporate an obsolescence redesign of the 50 inch Configuration 2 (C2) boost vehicle and the new RKV to improve GBI fleet capacity and reliability.

The FY 2018 budget included \$56M Advanced Procurement for long lead materials and components for 4 GBIs, \$32 million for long lead materials and equipment to construct 10 Silo Interface Vaults (SIVs) and silos for Missile Field #4 and \$180M to procure, install, and test 10 SIVs and silos for Missile Field #4.

The FY 2019 budget included \$115 million Advanced Procurement for long lead materials and components for 8 GBIs, \$220.6 million to procure, install and test 12 SIVs and silos for Missile Field 1 (quantity 1) and the new Missile Field #4, and \$197M to procure 4 GBIs.

The FY 2020 Budget request of \$9.471 million provides mitigation of GBI obsolescence-driven redesign and testing in support of GBI procurements.

Redesigned Kill Vehicle development technical issues has delayed the remaining procurement of GBIs to FY21.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity:
0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency

P-1 Line Item Number / Title:
MD08 / Ground Based Midcourse

ID Code (A=Service Ready, B=Not Service Ready): A **Program Elements for Code B Items:** 0603882C **Other Related Program Elements:** 0603882C

Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	Ground Based Midcourse		A		0 / 0.000	- / 0.000	- / 0.000	- / 124.471	- / -	- / 124.471
P-5	Ground Based Interceptors (GBI) [None]	P-5a, P-21	A		0 / 0.000	- / 0.000	4 / 253.000	- / -	- / -	- / -
P-5	Silo Interface Vaults/Silos	P-5a, P-21	A		0 / 0.000	10 / 227.000	12 / 252.600	- / -	- / -	- / -
P-40	Total Gross/Weapon System Cost				0 / 0.000	10 / 227.000	16 / 505.600	- / 124.471	- / -	- / 124.471

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
N/A

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Ground Based Midcourse

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (<i>Units in Each</i>)	0	-	-	-	-	-
Gross/Weapon System Cost (<i>\$ in Millions</i>)	0.000	0.000	0.000	124.471	-	124.471
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	115.000	-	115.000
Net Procurement (P-1) (<i>\$ in Millions</i>)	0.000	0.000	0.000	9.471	-	9.471
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	0.000	0.000	0.000	9.471	-	9.471

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware Cost																		
Recurring Cost																		
Ground Based Interceptors (GBI)	-	-	-	-	-	-	-	-	-	115.000	1	115.000	-	-	-	115.000	1	115.000
<i>Subtotal: Recurring Cost</i>	-	-	-	-	-	-	-	-	-	-	-	115.000	-	-	-	-	-	115.000
<i>Subtotal: Hardware Cost</i>	-	-	-	-	-	-	-	-	-	-	-	115.000	-	-	-	-	-	115.000
Support Cost																		
Obsolescence	-	-	-	-	-	-	-	-	-	9.471	1	9.471	-	-	-	9.471	1	9.471
<i>Subtotal: Support Cost</i>	-	-	-	-	-	-	-	-	-	-	-	9.471	-	-	-	-	-	9.471
Gross/Weapon System Cost	0.000	0	0.000	0.000	-	0.000	0.000	-	0.000	-	-	124.471	-	-	-	-	-	124.471

Remarks:
N/A

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Ground Based Interceptors (GBI) [None]

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	0	-	4	-	-	-
Gross/Weapon System Cost (\$ in Millions)	0.000	0.000	253.000	-	-	-
Less PY Advance Procurement (\$ in Millions)	0.000	0.000	56.000	-	-	-
Net Procurement (P-1) (\$ in Millions)	0.000	0.000	197.000	-	-	-
Plus CY Advance Procurement (\$ in Millions)	0.000	56.000	115.000	-	-	-
Total Obligation Authority (\$ in Millions)	0.000	56.000	312.000	-	-	-

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	0.000	0.000	63.250	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware Cost																		
Recurring Cost																		
Ground Based Interceptors ^(†)	-	-	-	-	-	-	63.250	4	253.000	-	-	-	-	-	-	-	-	-
<i>Subtotal: Recurring Cost</i>	-	-	-	-	-	-	-	-	253.000	-	-	-	-	-	-	-	-	-
<i>Subtotal: Hardware Cost</i>	-	-	-	-	-	-	-	-	253.000	-	-	-	-	-	-	-	-	-
Gross/Weapon System Cost	0.000	0	0.000	0.000	-	0.000	63.250	4	253.000	-	-	-	-	-	-	-	-	-

Remarks:
N/A

^(†) indicates the presence of a P-5a

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Ground Based Interceptors (GBI) [None]
--	---	---

Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty <i>(Each)</i>	Unit Cost <i>(\$ M)</i>	Specs Avail Now?	Date Revision Available	RFP Issue Date
Ground Based Interceptors - Hardware ^(†)		2019	Boeing / Huntsville	C / CPIF	Huntsville	Oct 2018	Jan 2019	4	63.250	N		Jan 2018

^(†) indicates the presence of a P-21

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17 **P-1 Line Item Number / Title:** MD08 / Ground Based Midcourse **Item Number / Title [DODIC]:** Ground Based Interceptors (GBI) [None]

Cost Elements <i>(Units in Each)</i>						Fiscal Year 2019												Fiscal Year 2020												BALANCE	
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2018	BAL DUE AS OF 1 OCT	Calendar Year 2019												Calendar Year 2020												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
Ground Based Interceptors - Hardware																															
	1	2019	MDA	4	0	4	A	-	-	-	4																		0		
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency	Date: March 2019
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Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Ground Based Interceptors (GBI) [None]
--	---	---

MFR Ref #	Manufacturer Name - Location	Production Rates (Each / Month)			Procurement Leadtime (Months)							
		MSR For 2020	1-8-5 For 2020	MAX For 2020	Initial				Reorder			
					ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1	ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1
1	Boeing - Huntsville	1	1	2	6	0	38	38	6	0	38	38

"A" in the Delivery Schedule indicates the Contract Award Date.

Note: Due to space limitations, quantities in the Exhibit P-21 delivery calendar are truncated and rounded based on the maximum quantity in the calendar as follows. If the maximum quantity is less than or equal to than 9,999, all quantities are shown as each. If the maximum quantity is between 10,000 and 999,999 all quantities are shown in thousands. If the maximum quantity is between 1,000,000 and 999,999,999 all quantities are shown in millions (rounded to the nearest thousand). If the maximum quantity is equal or greater than 1,000,000,000 all quantities are shown in billions (rounded to the nearest million).

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Silo Interface Vaults/Silos

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (<i>Units in Each</i>)	0	10	12	-	-	-
Gross/Weapon System Cost (<i>\$ in Millions</i>)	0.000	227.000	252.600	-	-	-
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	47.000	32.000	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	0.000	180.000	220.600	-	-	-
Plus CY Advance Procurement (<i>\$ in Millions</i>)	47.000	32.000	0.000	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	47.000	212.000	220.600	-	-	-

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	0.000	22.700	21.050	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost <i>(\$ M)</i>	Qty <i>(Each)</i>	Total Cost <i>(\$ M)</i>	Unit Cost <i>(\$ M)</i>	Qty <i>(Each)</i>	Total Cost <i>(\$ M)</i>	Unit Cost <i>(\$ M)</i>	Qty <i>(Each)</i>	Total Cost <i>(\$ M)</i>	Unit Cost <i>(\$ M)</i>	Qty <i>(Each)</i>	Total Cost <i>(\$ M)</i>	Unit Cost <i>(\$ M)</i>	Qty <i>(Each)</i>	Total Cost <i>(\$ M)</i>	Unit Cost <i>(\$ M)</i>	Qty <i>(Each)</i>	Total Cost <i>(\$ M)</i>
Hardware Cost																		
Non Recurring Cost																		
Silos ^(†)	-	-	-	22.700	10	227.000	21.050	12	252.600	-	-	-	-	-	-	-	-	-
<i>Subtotal: Non Recurring Cost</i>	-	-	-	-	-	227.000	-	-	252.600	-	-	-	-	-	-	-	-	-
<i>Subtotal: Hardware Cost</i>	-	-	-	-	-	227.000	-	-	252.600	-	-	-	-	-	-	-	-	-
Gross/Weapon System Cost	0.000	0	0.000	22.700	10	227.000	21.050	12	252.600	-	-	-	-	-	-	-	-	-

Remarks:

N/A

^(†) indicates the presence of a P-5a

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Silo Interface Vaults/Silos
--	---	--

Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty <i>(Each)</i>	Unit Cost <i>(\$ M)</i>	Specs Avail Now?	Date Revision Available	RFP Issue Date
Silos - Hardware ^(†)		2018	Boeing / AL/AK/AZ/CA/CO/VA	SS / CPIF	Huntsville, AL	Jan 2018	Sep 2019	10	22.700	Y	Sep 2018	Jan 2018
Silos - Hardware ^(†)		2019	Boeing / AL/AK/AZ/CA/CO/VA	SS / CPIF	Huntsville, AL	Jan 2018	Sep 2020	12	21.050	N	Sep 2018	Jan 2018

^(†) indicates the presence of a P-21

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Silo Interface Vaults/Silos
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Cost Elements <i>(Units in Each)</i>							Fiscal Year 2018														Fiscal Year 2019														BALANCE
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2017	BAL DUE AS OF 1 OCT	Calendar Year 2018														Calendar Year 2019														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Silos - Hardware																																			
	1	2018	MDA	10	0	10																								4	6				
	1	2019	MDA	12	0	12																								-	12				
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Silo Interface Vaults/Silos
--	---	--

Cost Elements <i>(Units in Each)</i>						Fiscal Year 2020												Fiscal Year 2021												BALANCE	
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2019	BAL DUE AS OF 1 OCT	Calendar Year 2020												Calendar Year 2021												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
Silos - Hardware																															
	1	2018	MDA	10	4	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0		
	1	2019	MDA	12	0	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	0		
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	Item Number / Title [DODIC]: Silo Interface Vaults/Silos
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MFR Ref #	Manufacturer Name - Location	Production Rates (Each / Month)			Procurement Leadtime (Months)							
		MSR For 2020	1-8-5 For 2020	MAX For 2020	Initial				Reorder			
					ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1	ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1
1	Boeing - AL/AK/AZ/CA/CO/VA	1	1	6	6	0	20	20	6	0	20	20

"A" in the Delivery Schedule indicates the Contract Award Date.
Note: Due to space limitations, quantities in the Exhibit P-21 delivery calendar are truncated and rounded based on the maximum quantity in the calendar as follows. If the maximum quantity is less than or equal to than 9,999, all quantities are shown as each. If the maximum quantity is between 10,000 and 999,999 all quantities are shown in thousands. If the maximum quantity is between 1,000,000 and 999,999,999 all quantities are shown in millions (rounded to the nearest thousand). If the maximum quantity is equal or greater than 1,000,000,000 all quantities are shown in billions (rounded to the nearest million).

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Exhibit P-40, Advance Procurement Budget Line Item Justification: PB 2020 Missile Defense Agency							Date: March 2019				
Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency							P-1 Line Item Number / Title: MD08 / Ground Based Midcourse				
Program Elements for Code B Items: 0603882C							Other Related Program Elements: 0603882C				
Line Item MDAP/MAIS Code: 362											

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Gross/Weapon System Cost (<i>\$ in Millions</i>)	47.000	88.000	115.000	-	-	-	113.882	114.516	45.799	32.776	Continuing	Continuing
Net Procurement (P-1) (<i>\$ in Millions</i>)	47.000	88.000	115.000	-	-	-	113.882	114.516	45.799	32.776	Continuing	Continuing
Total Obligation Authority (<i>\$ in Millions</i>)	47.000	88.000	115.000	-	-	-	113.882	114.516	45.799	32.776	Continuing	Continuing

Description:

Advanced Procurement required to expand the number of operationally deployed GBIs from 44 to 64. To accomplish this, MDA will build a new 20 silo Missile Field #4 at Fort Greely, Alaska as well as procure 20 additional Ground Based Interceptors with Configuration 2 boosters and Redesigned Kill Vehicles. The procurement funded efforts in MD08 include 20 Missile Field #4 silo interface vaults and silos, 2 Missile Field #1 silo interface vaults and silos and 20 All Up Round GBIs.

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Exhibit P-40, Advance Procurement Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse
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Program Elements for Code B Items: 0603882C	Other Related Program Elements: 0603882C
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Line Item MDAP/MAIS Code: 362

Exhibits Schedule				Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-10	Ground Based Midcourse			0 / 0.000	- / 0.000	- / 0.000	- / -	- / -	- / -
P-10	Ground Based Interceptors (GBI) [None]			0 / 0.000	- / 56.000	4 / 115.000	- / -	- / -	- / -
P-10	Silo Interface Vaults/Silos			0 / 47.000	10 / 32.000	12 / 0.000	- / -	- / -	- / -
P-40	Total Gross/Weapon System Cost			0 / 47.000	10 / 88.000	16 / 115.000	- / -	- / -	- / -

*Title represents the P-10 Title for Advance Procurement.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
 Redesigned Kill Vehicle development technical issues delays the procurement of GBIs to FY21.

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Exhibit P-10, Advance Procurement Requirements Analysis (page 1 - Budget Funding Justification): PB 2020 Missile Defense Agency					Date: March 2019	
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17			P-1 Line Item Number / Title: MD08 / Ground Based Midcourse		P-5 Number / Title: Ground Based Midcourse	
First System (2020) Award Date: January 2018		First System (2020) Completion Date: April 2021		Interval Between Systems: 3 Months		
Ground Based Midcourse		Production Leadtime <i>(Months)</i>	Prior Years <i>(Each)</i>	FY 2018 <i>(Each)</i>	FY 2019 <i>(Each)</i>	FY 2020 <i>(Each)</i>
Quantity		38	0	-	-	-
Cost Elements		When Required <i>(Months)</i>	Prior Years <i>(\$ M)</i>	FY 2018 <i>(\$ M)</i>	FY 2019 <i>(\$ M)</i>	FY 2020 <i>(\$ M)</i>
Other						
Ground Based Interceptor - FY2021		0	-	-	-	0.000
Ground Based Interceptor - FY2022		0	-	-	-	0.000
RKV Manufacturing - FY2023		0	-	-	-	0.000
RKV Manufacturing - FY2024		0	-	-	-	0.000
<i>Total: Other</i>			<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>
Total Advance Procurement/Obligation Authority			0.000	0.000	0.000	-

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Exhibit P-10, Advance Procurement Requirements Analysis (page 2 - Budget Funding Justification): PB 2020 Missile Defense Agency						Date: March 2019	
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17		P-1 Line Item Number / Title: MD08 / Ground Based Midcourse				P-5 Number / Title: Ground Based Midcourse	
Cost Elements	QPA <i>(Each)</i>	FY 2020					
		Production Leadtime <i>(Months)</i>	Unit Cost <i>(\$ M)</i>	Contract Forecast Date	2020 Qty <i>(Each)</i>	For FY	Total Cost Request <i>(\$ M)</i>
Other							
Ground Based Interceptor - FY2021	1					2022	0.000
Ground Based Interceptor - FY2022	1					2023	0.000
RKV Manufacturing - FY2023	1					2024	0.000
RKV Manufacturing - FY2024	1					2024	0.000
<i>Total: Other</i>							<i>0.000</i>
Total Advance Procurement/Obligation Authority							-
Description: Long lead materials for Ground Based Interceptors							

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Exhibit P-10, Advance Procurement Requirements Analysis (page 1 - Budget Funding Justification): PB 2020 Missile Defense Agency					Date: March 2019	
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17			P-1 Line Item Number / Title: MD08 / Ground Based Midcourse		P-5 Number / Title: Ground Based Interceptors (GBI) [None]	
First System (2020) Award Date: January 2018		First System (2020) Completion Date: April 2021		Interval Between Systems: 3 Months		
Ground Based Interceptors (GBI)		Production Leadtime <i>(Months)</i>	Prior Years <i>(Each)</i>	FY 2018 <i>(Each)</i>	FY 2019 <i>(Each)</i>	FY 2020 <i>(Each)</i>
Quantity		38	0	-	4	-
Cost Elements		When Required <i>(Months)</i>	Prior Years <i>(\$ M)</i>	FY 2018 <i>(\$ M)</i>	FY 2019 <i>(\$ M)</i>	FY 2020 <i>(\$ M)</i>
Other						
Hardware FY18		0	-	56.000	-	0.000
Hardware FY19		0	-	-	115.000	0.000
<i>Total: Other</i>			<i>0.000</i>	<i>56.000</i>	<i>115.000</i>	<i>0.000</i>
Total Advance Procurement/Obligation Authority			0.000	56.000	115.000	-

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Exhibit P-10, Advance Procurement Requirements Analysis (page 2 - Budget Funding Justification): PB 2020 Missile Defense Agency	Date: March 2019
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Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	P-5 Number / Title: Ground Based Interceptors (GBI) [None]
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Cost Elements	QPA <i>(Each)</i>	FY 2020					Total Cost Request <i>(\$ M)</i>
		Production Leadtime <i>(Months)</i>	Unit Cost <i>(\$ M)</i>	Contract Forecast Date	2020 Qty <i>(Each)</i>	For FY	
Other							
Hardware FY18	1						0.000
Hardware FY19	1						0.000
<i>Total: Other</i>							<i>0.000</i>
Total Advance Procurement/Obligation Authority							-

Description:
Long lead materials for Ground Based Interceptors

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Exhibit P-10, Advance Procurement Requirements Analysis (page 1 - Budget Funding Justification): PB 2020 Missile Defense Agency					Date: March 2019		
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17			P-1 Line Item Number / Title: MD08 / Ground Based Midcourse			P-5 Number / Title: Silo Interface Vaults/Silos	
First System (2020) Award Date: January 2018		First System (2020) Completion Date: September 2019			Interval Between Systems: 12 Months		
Silo Interface Vaults/Silos		Production Leadtime <i>(Months)</i>	Prior Years <i>(Each)</i>	FY 2018 <i>(Each)</i>	FY 2019 <i>(Each)</i>	FY 2020 <i>(Each)</i>	
Quantity		20	0	10	12	-	
Cost Elements		When Required <i>(Months)</i>	Prior Years <i>(\$ M)</i>	FY 2018 <i>(\$ M)</i>	FY 2019 <i>(\$ M)</i>	FY 2020 <i>(\$ M)</i>	
Other							
Hardware FY17		0	47.000	-	-	0.000	
Hardware FY18		0	-	32.000	-	0.000	
<i>Total: Other</i>			<i>47.000</i>	<i>32.000</i>	<i>0.000</i>	<i>0.000</i>	
Total Advance Procurement/Obligation Authority			47.000	32.000	0.000	-	

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Exhibit P-10, Advance Procurement Requirements Analysis (page 2 - Budget Funding Justification): PB 2020 Missile Defense Agency	Date: March 2019
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Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD08 / Ground Based Midcourse	P-5 Number / Title: Silo Interface Vaults/Silos
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Cost Elements	QPA <i>(Each)</i>	FY 2020					Total Cost Request <i>(\$ M)</i>
		Production Leadtime <i>(Months)</i>	Unit Cost <i>(\$ M)</i>	Contract Forecast Date	2020 Qty <i>(Each)</i>	For FY	
Other							
Hardware FY17	1						0.000
Hardware FY18	1						0.000
<i>Total: Other</i>							<i>0.000</i>
Total Advance Procurement/Obligation Authority							-

Description:
Long lead materials for Silos

UNCLASSIFIED

Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD09 / AEGIS BMD
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ID Code (A=Service Ready, B=Not Service Ready): B	Program Elements for Code B Items: 0604881C, 0603892C	Other Related Program Elements: 0603892C, 0604881C
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	232	64	44	37	-	37	40	43	52	46	Continuing	Continuing
Gross/Weapon System Cost (<i>\$ in Millions</i>)	3,715.231	1,083.353	700.490	600.773	-	600.773	616.902	676.813	839.173	805.558	Continuing	Continuing
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	46.024	59.764	53.600	-	-	159.388
Net Procurement (P-1) (<i>\$ in Millions</i>)	3,715.231	1,083.353	700.490	600.773	-	600.773	570.878	617.049	785.573	805.558	Continuing	Continuing
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	96.995	-	96.995	44.900	17.493	-	-	-	159.388
Total Obligation Authority (<i>\$ in Millions</i>)	3,715.231	1,083.353	700.490	697.768	-	697.768	615.778	634.542	785.573	805.558	Continuing	Continuing

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	33.646	10.498	13.498	12.786	-	12.786	11.997	12.515	13.450	-	Continuing	Continuing
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	16.014	16.927	15.920	16.237	-	16.237	15.423	15.740	16.138	17.512	Continuing	Continuing

Description:

For FY 2018 to FY 2024:

Flyaway unit cost represents the weighted average of Standard Missile-3 (SM-3) Block IB and SM-3 Block IIA missiles.

Net Procurement and Gross Weapon System costs includes all hardware and support costs and are detailed in separate P5s.

Prior Year procurement quantity of 232 SM-3 Block IB's does not include 71 SM-3 Block IAs.

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 SM-3 configuration enable Aegis BMD to provide an effective, supportable, and defensive capability against longer range, more sophisticated threats and an enduring Aegis Ashore defensive capability.

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 provides greater capability over SM-3 Block IB, 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 KW. New component technologies include, but are not limited to: lightweight nosecone, advanced KW, 21-inch second stage rocket motor, and 21-inch third stage rocket motor. Working in concert with the SM-3 Block IB, the SM-3 Block IIA, will increase the BMDS defended area and increase the probability of kill against a larger threat set. The SM-3 Block IIA is also a critical part of the Aegis Ashore Missile Defense System Complex - Romania and Poland, and is also vital to defense efforts for Aegis afloat in the European and Indo-Pacific Commands. This will provide a more robust protection of Europe and the Indo-Pacific. The SM-3 Block IIA also provides defense against IRBMs and other threats.

FY 2018 procures 44 SM-3 IB AURs, 20 SM-3 IIA AURs plus canisters, production engineering, Obsolescence and system engineering and integration.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency		P-1 Line Item Number / Title: MD09 / AEGIS BMD
ID Code (A=Service Ready, B=Not Service Ready): B	Program Elements for Code B Items: 0604881C, 0603892C	Other Related Program Elements: 0603892C, 0604881C
Line Item MDAP/MAIS Code: 362		
FY 2019 procures 34 SM-3 IB and 10 SM-3 IIA AURs plus canisters, production engineering, Obsolescence and system engineering and integration.		
FY 2020 procures 30 SM-3 IB and 7 SM-3 IIA AURs plus canisters, production engineering, Obsolescence and system engineering and Integration.		
See the Advanced Procurement Exhibit for a detailed description and justification of SM-3 Blk IB Advanced Procurement to support Multiyear Economic Order Quantities.		

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity:
0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency

P-1 Line Item Number / Title:
MD09 / AEGIS BMD

ID Code (A=Service Ready, B=Not Service Ready): B **Program Elements for Code B Items:** 0604881C, 0603892C **Other Related Program Elements:** 0603892C, 0604881C

Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	Aegis BMD SM-3 Block IB	P-5a, P-21	B		232 / 3,715.231	44 / 521.106	34 / 411.679	30 / 362.773	- / -	30 / 362.773
P-5	Aegis BMD SM-3 Block IIA		B		0 / 0.000	20 / 562.247	10 / 288.811	7 / 238.000	- / -	7 / 238.000
P-40	Total Gross/Weapon System Cost				232 / 3,715.231	64 / 1,083.353	44 / 700.490	37 / 600.773	- / -	37 / 600.773

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
N/A

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency											Date: March 2019						
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17						P-1 Line Item Number / Title: MD09 / AEGIS BMD					Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB						
ID Code (A=Service Ready, B=Not Service Ready) : B											MDAP/MAIS Code:						
Resource Summary				Prior Years		FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Procurement Quantity (Units in Each)				232		44		34		30		-		30			
Gross/Weapon System Cost (\$ in Millions)				3,715.231		521.106		411.679		362.773		-		362.773			
Less PY Advance Procurement (\$ in Millions)				0.000		0.000		0.000		-		-		-			
Net Procurement (P-1) (\$ in Millions)				3,715.231		521.106		411.679		362.773		-		362.773			
Plus CY Advance Procurement (\$ in Millions)				0.000		0.000		0.000		96.995		-		96.995			
Total Obligation Authority (\$ in Millions)				3,715.231		521.106		411.679		459.768		-		459.768			
<i>(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)</i>																	
Initial Spares (\$ in Millions)				-		-		-		-		-		-		-	
Gross/Weapon System Unit Cost (\$ in Millions)				16.014		11.843		12.108		12.092		-		12.092			

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Flyaway Cost																		
Recurring Cost																		
SM-3 Block IA Procurement ^(†)	10.800	71	766.765	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SM-3 Block IB Procurement ^(†)	11.318	232	2,625.774	10.796	44	475.036	10.589	34	360.029	10.780	30	323.399	-	-	-	10.780	30	323.399
<i>Subtotal: Recurring Cost</i>	-	-	<i>3,392.539</i>	-	-	<i>475.036</i>	-	-	<i>360.029</i>	-	-	<i>323.399</i>	-	-	-	-	-	<i>323.399</i>
<i>Subtotal: Flyaway Cost</i>	-	-	<i>3,392.539</i>	-	-	<i>475.036</i>	-	-	<i>360.029</i>	-	-	<i>323.399</i>	-	-	-	-	-	<i>323.399</i>
Hardware Cost																		
Recurring Cost																		
Canisters Procurement SM-3 Block IA/IB (1)	0.231	244	56.316	0.261	45	11.751	0.272	35	9.518	0.253	30	7.576	-	-	-	0.253	30	7.576
<i>Subtotal: Recurring Cost</i>	-	-	<i>56.316</i>	-	-	<i>11.751</i>	-	-	<i>9.518</i>	-	-	<i>7.576</i>	-	-	-	-	-	<i>7.576</i>
<i>Subtotal: Hardware Cost</i>	-	-	<i>56.316</i>	-	-	<i>11.751</i>	-	-	<i>9.518</i>	-	-	<i>7.576</i>	-	-	-	-	-	<i>7.576</i>
Support Cost																		
Ballistic Barriers for Transportation SM-3 Block IB (2)	0.311	28	8.704	-	-	-	0.282	8	2.259	-	-	-	-	-	-	-	-	-
Cyber Security (3)	-	-	-	-	-	-	-	-	-	1.500	1	1.500	-	-	-	1.500	1	1.500
Diminishing Manufacturing Sources Mitigation (4)	13.854	1	13.854	-	-	-	3.461	1	3.461	3.660	1	3.660	-	-	-	3.660	1	3.660
SM-3 Block IB Investment Spares (5)	5.600	1	5.600	4.041	1	4.041	14.826	1	14.826	8.688	1	8.688	-	-	-	8.688	1	8.688

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
ID Code (A=Service Ready, B=Not Service Ready) : B		MDAP/MAIS Code:

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
SM-3 Block IB Obsolescence (6)	50.000	1	50.000	0.946	1	0.946	1.328	1	1.328	1.367	1	1.367	-	-	-	1.367	1	1.367
SM-3 Block IB Production Engineering (7)	30.959	6	185.751	19.526	1	19.526	6.598	1	6.598	4.080	1	4.080	-	-	-	4.080	1	4.080
SM-3 Block IB Service Life Evaluation Program (8)	2.467	1	2.467	7.262	1	7.262	2.000	1	2.000	2.000	1	2.000	-	-	-	2.000	1	2.000
SM-3 Block IB Systems Engineering And Integration (9)	-	-	-	2.544	1	2.544	11.660	1	11.660	10.503	1	10.503	-	-	-	10.503	1	10.503
<i>Subtotal: Support Cost</i>	-	-	266.376	-	-	34.319	-	-	42.132	-	-	31.798	-	-	-	-	-	31.798
Gross/Weapon System Cost	16.014	232	3,715.231	11.843	44	521.106	12.108	34	411.679	12.092	30	362.773	-	-	-	12.092	30	362.773

Remarks:

- (1) Canisters are required for each SM-3 procured.
- (2) SM-3 Transportation of Ballistic Barriers are required by Joint Service Insensitive Munitions Technical Panel (JSIMTP) and Naval Ordnance Safety and Security Activity (NOSSA) to transport missiles.
- (3) Cyber Enhanced Security starts in FY 2020.
- (4) DMSM allows Aegis Ballistic Missile Defense to mitigate the loss, or impending loss, of manufacturers of items or suppliers of items or of raw materials caused by several factors including new or evolving science, detection limits, toxicity values, and regulations related to chemicals and materials resulting in significant impact on the supply chain and industrial base. These issues have the potential to impact future combat systems and safety.
- (5) SM-3 Block IB Investment Spares are procured to coincide with the delivery of the missile and are required to support AURs during 4 year maintenance period.
- (6) Obsolescence monitoring and management is the program's most effective and efficient way to minimize materiel readiness risks, realize future savings during production and sustainment, and improve overall life-cycle management. Identifies risk associated with the 800 vendors/suppliers discontinuing production of a component or raw material and then properly mitigating impacts to production. If not identified early, such activities will impact production and Fleet deliveries.
- (7) Production Engineering supports SM-3 Guided Missile Round (GMR) production activities and issue resolution during manufacturing, assembly, testing, and missile integration. Funding provides production change validation, preparation, and configuration management, government prepared production acceptance procedures, production planning, Integrated Logistics Support (ILS) planning, coordination of government furnished information (GFI) and government furnished equipment (GFE), contract deliverable monitoring and prime contractor monitoring of cost/schedule performance. Also provides in-service engineering agent (ISEA) and technical direction agent (TDA) support.
- (8) SM-3 Block IB Service Life Evaluation Program includes testing and analysis to demonstrate the safety and suitability of the SM-3 for an extended service life goal of 16 years.

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
ID Code (A=Service Ready, B=Not Service Ready) : B	MDAP/MAIS Code:	
<p>(9) Systems Engineering and Integration - Addresses production technical issues that arise within the entire SM-3 vendor/supplier base. Includes improvement and efficiency activities such as configuration management and control boards, engineering assessments of manufacturing process improvement changes, engineering assessments of sub-vendor production issues, and engineering and quality review of documentation and test data prior to missile acceptance by the government.</p> <p>(t) indicates the presence of a P-5a</p>		

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty <i>(Each)</i>	Unit Cost <i>(\$ M)</i>	Specs Avail Now?	Date Revision Available	RFP Issue Date
SM-3 Block IA Procurement ^(†)		2009	Raytheon / Tucson, AZ	C / CPIF	Dahlgren, VA	Feb 2008	Mar 2010	11	8.405	Y		Mar 2007
SM-3 Block IA Procurement ^(†)		2010	Raytheon / Tucson, AZ	C / CPIF	Dahlgren, VA	Apr 2008	Aug 2010	24	8.119	Y		Mar 2007
SM-3 Block IA Procurement ^(†)		2011	Raytheon / Tucson, AZ	C / CPIF	Dahlgren, VA	Aug 2012	Sep 2013	22	9.525	Y		Nov 2010
SM-3 Block IA Procurement ^(†)		2012	Raytheon / Tucson, AZ	C / CPIF	Dahlgren, VA	Aug 2012	Jul 2014	14	9.867	Y		Aug 2011
SM-3 Block IB Procurement ^(†)		2012	Raytheon / Tucson, AZ	C / CPIF	Dahlgren, VA	May 2012	Dec 2013	14	13.400	Y		Aug 2011
SM-3 Block IB Procurement ^(†)		2013	Raytheon / Tucson, AZ	C / CPIF	Dahlgren, VA	Jun 2013	Jun 2014	33	12.130	Y		Aug 2012
SM-3 Block IB Procurement ^(†)		2014	Raytheon / Tucson, AZ	C / CPIF	Dahlgren, VA	Apr 2014	Jan 2016	52	10.236	Y		Aug 2013
SM-3 Block IB Procurement ^(†)		2015	Raytheon / Tucson, AZ	SS / FP	Dahlgren, VA	Mar 2015	Nov 2016	52	11.411	Y		Aug 2014
SM-3 Block IB Procurement ^(†)		2016	Raytheon / Tucson, AZ	SS / FP	Dahlgren, VA	Mar 2016	Oct 2018	46	11.538	Y		Aug 2015
SM-3 Block IB Procurement ^(†)		2017	Raytheon / Tucson, AZ	SS / FP	Dahlgren, VA	Mar 2017	Oct 2019	35	10.896	Y		Aug 2016

^(†) indicates the presence of a P-21

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2008												Fiscal Year 2009												BALANCE	
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2007	BAL DUE AS OF 1 OCT	Calendar Year 2008												Calendar Year 2009												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
SM-3 Block IA Procurement																															
	1	2009	MDA	11	0	11																							11		
	1	2010	MDA	24	0	24																							24		
	1	2011	MDA	22	0	22																							22		
	1	2012	MDA	14	0	14																							14		
SM-3 Block IB Procurement																															
	2	2012	MDA	14	0	14																							14		
	2	2013	MDA	33	0	33																							33		
	2	2014	MDA	52	0	52																							52		
	2	2015	MDA	52	0	52																							52		
	2	2016	MDA	46	0	46																							46		
	2	2017	MDA	35	0	35																							35		
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2010														Fiscal Year 2011														BALANCE	
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2009	BAL DUE AS OF 1 OCT	Calendar Year 2010														Calendar Year 2011														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
SM-3 Block IA Procurement																																			
1		2009	MDA	11	0	11	-	-	-	-	-	-	2	-	-	-	2	2	-	-	-	-	-	-	-	-	1	1	3				0		
1		2010	MDA	24	0	24	-	-	-	-	-	-	-	-	-	2	2	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13		
1		2011	MDA	22	0	22																										22			
1		2012	MDA	14	0	14																										14			
SM-3 Block IB Procurement																																			
2		2012	MDA	14	0	14																										14			
2		2013	MDA	33	0	33																										33			
2		2014	MDA	52	0	52																										52			
2		2015	MDA	52	0	52																										52			
2		2016	MDA	46	0	46																										46			
2		2017	MDA	35	0	35																										35			
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2012												Fiscal Year 2013												BALANCE	
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2011	BAL DUE AS OF 1 OCT	Calendar Year 2012												Calendar Year 2013												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
SM-3 Block IA Procurement																															
1		2009	MDA	11	11	0																							0		
1		2010	MDA	24	11	13	-	-	-	-	6	-	1	-	-	2	-	3	-	-	-	-	-	-	-	-	-	-	1	0	
1		2011	MDA	22	0	22																						1	21		
1		2012	MDA	14	0	14																						-	14		
SM-3 Block IB Procurement																															
2		2012	MDA	14	0	14																						-	14		
2		2013	MDA	33	0	33																						A -	33		
2		2014	MDA	52	0	52																						-	52		
2		2015	MDA	52	0	52																						-	52		
2		2016	MDA	46	0	46																						-	46		
2		2017	MDA	35	0	35																						-	35		
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2014												Fiscal Year 2015												BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2013	BAL DUE AS OF 1 OCT	Calendar Year 2014												Calendar Year 2015												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
SM-3 Block IA Procurement																															
	1	2009	MDA	11	11	0																							0		
	1	2010	MDA	24	24	0																							0		
	1	2011	MDA	22	1	21	5	1	2	1	-	3	4	1	1	3													0		
	1	2012	MDA	14	0	14	-	-	-	-	-	-	-	-	2	1	3	-	-	-	3	4	-	1					0		
SM-3 Block IB Procurement																															
	2	2012	MDA	14	0	14	-	-	1	3	2	3	1	2	2														0		
	2	2013	MDA	33	0	33	-	-	-	-	-	-	-	-	2	1	-	1	-	6	3	1	-	3	2	4	-	-	-	1	9
	2	2014	MDA	52	0	52							A -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52		
	2	2015	MDA	52	0	52																		A -	-	-	-	-	-	52	
	2	2016	MDA	46	0	46																							46		
	2	2017	MDA	35	0	35																							35		
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2016														Fiscal Year 2017										BALANCE	
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2015	BAL DUE AS OF 1 OCT	Calendar Year 2016														Calendar Year 2017										
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
SM-3 Block IA Procurement																															
	1	2009	MDA	11	11	0																							0		
	1	2010	MDA	24	24	0																							0		
	1	2011	MDA	22	22	0																							0		
	1	2012	MDA	14	14	0																							0		
SM-3 Block IB Procurement																															
	2	2012	MDA	14	14	0																							0		
	2	2013	MDA	33	24	9	4	-	5																				0		
	2	2014	MDA	52	0	52	-	-	-	2	-	-	-	2	-	-	14	6	-	-	12	5	5	4	2					0	
	2	2015	MDA	52	0	52	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	2	6	3	-	5	8	25
	2	2016	MDA	46	0	46																									46
	2	2017	MDA	35	0	35																				A	-	-	-	-	35
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2018												Fiscal Year 2019												BALANCE	
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEP T P R I O R T O 1 O C T 2 0 1 7	BAL D U E A S O F 1 O C T	Calendar Year 2018												Calendar Year 2019												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
SM-3 Block IA Procurement																															
	1	2009	MDA	11	11	0																							0		
	1	2010	MDA	24	24	0																							0		
	1	2011	MDA	22	22	0																							0		
	1	2012	MDA	14	14	0																							0		
SM-3 Block IB Procurement																															
	2	2012	MDA	14	14	0																							0		
	2	2013	MDA	33	33	0																							0		
	2	2014	MDA	52	52	0																							0		
	2	2015	MDA	52	27	25	3	-	9	-	-	-	-	-	-	-	-	-	13									0			
	2	2016	MDA	46	0	46	-	-	-	-	-	-	-	-	-	-	-	4	-	5	5	6	6	4	4	6	6	0			
	2	2017	MDA	35	0	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35			
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2020													Fiscal Year 2021													BALANCE	
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEP T P R I O R T O 1 O C T 2 0 1 9	BAL D U E A S O F 1 O C T	Calendar Year 2020													Calendar Year 2021													
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			
SM-3 Block IA Procurement																																	
	1	2009	MDA	11	11	0																								0			
	1	2010	MDA	24	24	0																								0			
	1	2011	MDA	22	22	0																								0			
	1	2012	MDA	14	14	0																								0			
SM-3 Block IB Procurement																																	
	2	2012	MDA	14	14	0																								0			
	2	2013	MDA	33	33	0																								0			
	2	2014	MDA	52	52	0																								0			
	2	2015	MDA	52	52	0																								0			
	2	2016	MDA	46	46	0																								0			
	2	2017	MDA	35	0	35	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	0			
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency	Date: March 2019
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Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IB
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MFR Ref #	Manufacturer Name - Location	Production Rates (Each / Month)			Procurement Leadtime (Months)							
		MSR For 2020	1-8-5 For 2020	MAX For 2020	Initial				Reorder			
					ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1	ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1
1	Raytheon - Tucson, AZ				4	0	30	30	4	0	30	30
2	Raytheon - Tucson, AZ	1	4	5	0	0	0	0	0	0	0	0

"A" in the Delivery Schedule indicates the Contract Award Date.

Note: Due to space limitations, quantities in the Exhibit P-21 delivery calendar are truncated and rounded based on the maximum quantity in the calendar as follows. If the maximum quantity is less than or equal to than 9,999, all quantities are shown as each. If the maximum quantity is between 10,000 and 999,999 all quantities are shown in thousands. If the maximum quantity is between 1,000,000 and 999,999,999 all quantities are shown in millions (rounded to the nearest thousand). If the maximum quantity is equal or greater than 1,000,000,000 all quantities are shown in billions (rounded to the nearest million).

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IIA

ID Code (A=Service Ready, B=Not Service Ready) : B	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	0	20	10	7	-	7
Gross/Weapon System Cost (\$ in Millions)	0.000	562.247	288.811	238.000	-	238.000
Less PY Advance Procurement (\$ in Millions)	0.000	0.000	0.000	-	-	-
Net Procurement (P-1) (\$ in Millions)	0.000	562.247	288.811	238.000	-	238.000
Plus CY Advance Procurement (\$ in Millions)	0.000	0.000	0.000	-	-	-
Total Obligation Authority (\$ in Millions)	0.000	562.247	288.811	238.000	-	238.000

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	0.000	28.112	28.881	34.000	-	34.000

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Flyaway Cost																		
Recurring Cost																		
SM-3 Block IIA Procurement	-	-	-	26.849	20	536.974	27.356	10	273.559	27.348	7	191.436	-	-	-	27.348	7	191.436
<i>Subtotal: Recurring Cost</i>	-	-	-	-	-	536.974	-	-	273.559	-	-	191.436	-	-	-	-	-	191.436
<i>Subtotal: Flyaway Cost</i>	-	-	-	-	-	536.974	-	-	273.559	-	-	191.436	-	-	-	-	-	191.436
Hardware Cost																		
Recurring Cost																		
Canisters Procurement SM-3 Block IIA (1)	-	-	-	1.203	21	25.273	1.263	11	13.898	1.054	8	8.433	-	-	-	1.054	8	8.433
<i>Subtotal: Recurring Cost</i>	-	-	-	-	-	25.273	-	-	13.898	-	-	8.433	-	-	-	-	-	8.433
<i>Subtotal: Hardware Cost</i>	-	-	-	-	-	25.273	-	-	13.898	-	-	8.433	-	-	-	-	-	8.433
Support Cost																		
SM-3 BLK IIA Investment Spares (2)	-	-	-	-	-	-	-	-	-	9.630	1	9.630	-	-	-	9.630	1	9.630
SM-3 BLK IIA Service Life Evaluation Programs (3)	-	-	-	-	-	-	-	-	-	20.645	1	20.645	-	-	-	20.645	1	20.645
SM-3 Block IIA Obsolescence (4)	-	-	-	-	-	-	-	-	-	4.860	1	4.860	-	-	-	4.860	1	4.860
SM-3 Block IIA Production Engineering (5)	-	-	-	-	-	-	1.354	1	1.354	2.996	1	2.996	-	-	-	2.996	1	2.996
<i>Subtotal: Support Cost</i>	-	-	-	-	-	-	-	-	1.354	-	-	38.131	-	-	-	-	-	38.131

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD09 / AEGIS BMD	Item Number / Title [DODIC]: Aegis BMD SM-3 Block IIA
ID Code (A=Service Ready, B=Not Service Ready) : B		MDAP/MAIS Code:

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Gross/Weapon System Cost	0.000	0	0.000	28.112	20	562.247	28.881	10	288.811	34.000	7	238.000	-	-	-	34.000	7	238.000

Remarks:

- (1) Canisters are required for each SM-3 procured. Historical trends have identified 1 canister/yr breaking during delivery, thus the request for a spare canister.
- (2) SM-3 Block IIA Initial Spares are procured to coincide with the delivery of the missile and are required to support AURs during 6 year maintenance period. This is the first year of including Initial Spares in the request.
- (3) SM-3 Block IIA Service Life Evaluation Program Testing and analysis program to demonstrate the safety and suitability of the SM-3 for an extended service life.
- (4) Obsolescence is the program's most effective and efficient way to minimize materiel readiness risks, realize future savings during production and sustainment, and improve overall life-cycle management. Identifies risk associated with the 800 vendors/suppliers discontinuing production of a component or raw material and then properly mitigating impacts to production. If not identified early, such activities will impact production and Fleet deliveries. The increase from FY 2019 to FY 2020 is to address obsolescence issues due to the missile in its second year of production and the highly complex design requiring the manufacture to ensure issues are identified early in the process and adequately addressed for manifesting into a production delay.
- (5) Production Engineering provides engineering efforts support of SM-3 Guided Missile Round (GMR) production activities, manage and resolve issues that arise during manufacturing, assembly, tests, and missile integration. In PB19, Special Tooling and Test Equipment is incorporated into this effort. This effort addresses production technical issues that arise within the entire SM-3 vendor/supplier base. Includes improvement and efficiency activities such as configuration management and control boards, engineering assessments of manufacturing process improvement changes, engineering assessments of sub-vendor production issues, and engineering and quality review of documentation and test data prior to missile acceptance by the government. Additionally, includes Special Tooling and Test Equipment which sustains and maintains the tools and test equipment vital to manufacture and test prior to government acceptance of new SM-3 missiles. The increase from FY 2019 to FY 2020 provides for Special Tooling and Test Equipment to address additional requirements due to the transition to production in FY 2018.

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Exhibit P-40, Advance Procurement Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD09 / AEGIS BMD
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Program Elements for Code B Items: 0604881C, 0603892C	Other Related Program Elements: 0603892C, 0604881C
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Gross/Weapon System Cost (<i>\$ in Millions</i>)	0.000	0.000	0.000	96.995	-	96.995	44.900	17.493	-	-	-	159.388
Net Procurement (P-1) (<i>\$ in Millions</i>)	0.000	0.000	0.000	96.995	-	96.995	44.900	17.493	-	-	-	159.388
Total Obligation Authority (<i>\$ in Millions</i>)	0.000	0.000	0.000	96.995	-	96.995	44.900	17.493	-	-	-	159.388

Description:

The Missile Defense Agency intends to award a five year Multi-Year Procurement (MYP) contract for 174 Standard Missile-3 Block IBs in 3QFY2019 through FY 2023 (final delivery FY 2026). This multiyear contract strategy uses Economic Order Quantity Advance Procurement (EOQ AP) funding to provide the U.S. Government maximum savings in price and delivery schedule. No EOQ AP was appropriated in FY 2019. This MYP requests \$96.995M EOQ AP funding in FY 2020 which results in savings for bulk purchases of materials and components to reduce material costs and for investments in productivity enhancements to reduce labor costs. EOQ AP funding will be applied to the production of 110 FY 2021-FY 2023 All Up Rounds (AUR). EOQ AP funding will enable Raytheon Missile System's to bulk order materials with long lead times, and authorize equipment suppliers and subcontractors to do the same with sufficient lead time to support the planned delivery schedule within the context of the multiyear funding, prices, and cancellation ceilings.

Many components have minimum buy quantities which may not be met under single year procurements, which result in increased unit costs. EOQ AP quantities will allow the prime contractor and subcontractors at all tiers to exceed minimum order quantities and capture cost avoidance on these components. Long-term Agreements will provide price discounts to guarantee business. Given EOQ AP, suppliers will have increased business and stability. Suppliers will implement innovative processes and capital investments necessary to reduce costs which result in missile unit cost savings. As a result of these process innovations and capital investments, obsolescence risks and costs are also expected to be minimized.

Procuring at a guaranteed rate of minimum production will also yield cost avoidances. Allowing the contractor to manage facilities and subcontractors to a guaranteed production rate will reduce costs by allowing the Prime and subcontractors to engage in activities including, but not limited to, reducing the number of production set-ups.

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Exhibit P-40, Advance Procurement Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD09 / AEGIS BMD
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Program Elements for Code B Items: 0604881C, 0603892C	Other Related Program Elements: 0603892C, 0604881C
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Line Item MDAP/MAIS Code: 362

Exhibits Schedule				Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-10	Aegis BMD SM-3 Block IB			232 / 0.000	44 / 0.000	34 / 0.000	30 / 96.995	- / -	30 / 96.995
P-40	Total Gross/Weapon System Cost			232 / 0.000	64 / 0.000	44 / 0.000	37 / 96.995	- / -	37 / 96.995

*Title represents the P-10 Title for Advance Procurement.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
 Economic Order Quantity Advanced Procurement (EOQ AP) procures long lead items in bulk for FY21 through FY23 lots in order to reduce the cost of subcontractor effort, material, and components as compared to single future fiscal year lot buys. The bulk advance buys enable greater production efficiencies and substantial cost savings over separate single year lot buys.

- FY 2020 Advance Procurement (\$96.995M) funding will procure the following major items for the FY21 through FY23 lots:
1. Kinetic Warhead Guidance Unit (29 month lead time) with estimated savings of 18% across Fiscal Year Defense Plan (FYDP).
 2. Third Stage Rocket Motors (24 month lead time) with estimated savings of 13% across FYDP.
 3. Throttling Divert Attitude Control System (25 month lead time) with estimated savings of 13% across FYDP.
 4. MK-72 Booster (25 month lead time) with estimated savings of 12% across FYDP.
 5. Guidance Section (Gravity Switch, Thermal Batteries) (23 month lead time) with estimated savings of 3% across FYDP.
 6. Sub-components and raw materials to facilitate missile production efficiencies including Integrated DEWAR Assembly Substrates, Fiber Material, Beryllium Material, Electronic Components, Printed Wire Boards, Housings, Antennas, DTRM Case Material, Harnesses, and Shell Material.

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Exhibit P-10, Advance Procurement Requirements Analysis (page 1 - Budget Funding Justification): PB 2020 Missile Defense Agency					Date: March 2019	
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17			P-1 Line Item Number / Title: MD09 / AEGIS BMD		P-5 Number / Title: Aegis BMD SM-3 Block IB	
First System (2020) Award Date: January 2018		First System (2020) Completion Date: October 2020		Interval Between Systems: 1 Months		
Aegis BMD SM-3 Block IB		Production Leadtime <i>(Months)</i>	Prior Years <i>(Each)</i>	FY 2018 <i>(Each)</i>	FY 2019 <i>(Each)</i>	FY 2020 <i>(Each)</i>
Quantity		30	232	44	34	30
Cost Elements		When Required <i>(Months)</i>	Prior Years <i>(\$ M)</i>	FY 2018 <i>(\$ M)</i>	FY 2019 <i>(\$ M)</i>	FY 2020 <i>(\$ M)</i>
EOQ						
Aegis Advanced Procurement		0	-	-	-	96.995
Total: EOQ			0.000	0.000	0.000	96.995
Total Advance Procurement/Obligation Authority			0.000	0.000	0.000	96.995

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Exhibit P-10, Advance Procurement Requirements Analysis (page 2 - Budget Funding Justification): PB 2020 Missile Defense Agency						Date: March 2019	
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17		P-1 Line Item Number / Title: MD09 / AEGIS BMD			P-5 Number / Title: Aegis BMD SM-3 Block IB		
		FY 2020					
Cost Elements	QPA <i>(Each)</i>	Production Leadtime <i>(Months)</i>	Unit Cost <i>(\$ M)</i>	Contract Forecast Date	2020 Qty <i>(Each)</i>	For FY	Total Cost Request <i>(\$ M)</i>
EOQ							
Aegis Advanced Procurement	0						96.995
<i>Total: EOQ</i>							96.995
Total Advance Procurement/Obligation Authority							96.995

Description:
The Advance Procurement (AP) funding provides economic order quantity (EOQ) to reduce the cost of subcontractor effort, material, and components enabling greater production efficiencies and substantial cost savings.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD11 / BMDS Sensors
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: 0603881C, 0603884C	Other Related Program Elements: 0603881C, 0603884C
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	5	-	-	-	-	-	-	-	-	-	-	5
Gross/Weapon System Cost (<i>\$ in Millions</i>)	1,177.590	11.947	13.185	10.046	-	10.046	-	-	-	9.654	-	1,222.422
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	1,177.590	11.947	13.185	10.046	-	10.046	-	-	-	9.654	-	1,222.422
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	1,177.590	11.947	13.185	10.046	-	10.046	-	-	-	9.654	-	1,222.422

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	10.901	-	-	-	-	-	-	-	-	-	-	10.901
Flyaway Unit Cost (<i>\$ in Millions</i>)	172.502	-	-	-	-	-	-	-	-	-	Continuing	Continuing
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	235.518	0.000	0.000	-	-	-	-	-	-	-	-	244.484

Description:

The Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2) radar is an integral component of the Ballistic Missile Defense System (BMDS) layered network of sensors. It is easily transported and can be configured to operate either as a Terminal High Altitude Area Defense (THAAD) Fire Unit Radar (terminal mode) or Forward-Based Radar. The forward-based AN/TPY-2 provides detection and tracking during the boost phase. This significantly reduces the uncertainty in target discrimination and reaction time, increasing the probability of a successful BMDS engagement. In forward-based mode, the AN/TPY-2 also provides acquisition and track data via the Ballistic Missile Defense System Command, Control, Battle Management and Communications (C2BMC) and Link 16 to the Aegis missile defense system for cueing. The AN/TPY-2 used in terminal mode is an integral component of the THAAD Battery. The THAAD battery radar is capable of tracking multiple threats and multiple interceptors during engagements in the terminal phase. It provides surveillance, acquisition, track, discrimination, interceptor communications, and hit assessment data collection for fire control.

Procurement funding acquired five AN/TPY-2 Radars required to complete the THAAD Battery acquisitions. "Procurement Quantity" and "Flyaway Unit Cost" represent AN/TPY-2 radar systems ((i.e. one Antenna Equipment Unit (AEU), one Cooling Equipment Unit, one Electronic Equipment Unit (EEU), and two Prime Power Units (PPU)) only, but the "Net Procurement" cost plus the Initial Spares amount includes the costs of all hardware.

The AN/TPY-2 EEU Modification Kits and Radar Field Upgrade (RAFU) Kits provide updated processing capabilities to EEU's in both Terminal and Forward-based modes. The AEU transformers include design improvements to extend the life of this mission critical component.

The COBRA DANE Transmitter Group Replacement (TGR) procurement is due to parts obsolescence concerns. A modern, supportable design will eliminate scores of currently unsupported parts.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency **P-1 Line Item Number / Title:** MD11 / BMDS Sensors

ID Code (A=Service Ready, B=Not Service Ready): A **Program Elements for Code B Items:** 0603881C, 0603884C **Other Related Program Elements:** 0603881C, 0603884C

Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	BMDS AN/TPY-2 Radars	P-5a, P-21	A		5 / 1,177.590	- / 11.947	- / 13.185	- / 10.046	- / -	- / 10.046
P-40	Total Gross/Weapon System Cost				5 / 1,177.590	- / 11.947	- / 13.185	- / 10.046	- / -	- / 10.046

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:

FY 2020 base procurement dollars in the amount of \$10.046 million procures one AEU transformer to replace the legacy transformer currently in each forward based AN/TPY-2 site. The newly designed AEU transformer will include design improvements to extend the life of this mission critical component. It also procures two AN/TPY-2 EEU Modification Kits and Radar Field Upgrade (RAFU) kits that provides updated processing capabilities in both Terminal and Forward-based mode AN/TP-2 Radars.

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	5	-	-	-	-	-
Gross/Weapon System Cost (\$ in Millions)	1,177.590	11.947	13.185	10.046	-	10.046
Less PY Advance Procurement (\$ in Millions)	0.000	0.000	0.000	-	-	-
Net Procurement (P-1) (\$ in Millions)	1,177.590	11.947	13.185	10.046	-	10.046
Plus CY Advance Procurement (\$ in Millions)	0.000	0.000	0.000	-	-	-
Total Obligation Authority (\$ in Millions)	1,177.590	11.947	13.185	10.046	-	10.046

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	235.518	0.000	0.000	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware Cost																		
Recurring Cost																		
Antenna Equipment Unit (AEU) ^(†)	130.482	5	652.411	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antenna Equipment Unit (AEU) Transformer ^(†)	1.331	5	6.655	0.947	1	0.947	0.978	1	0.978	0.869	1	0.869	-	-	-	0.869	1	0.869
COBRA DANE Transmitter Group Replacement ^(†)	-	-	-	11.000	1	11.000	8.000	1	8.000	-	-	-	-	-	-	-	-	-
Cooling Equipment Unit (CEU) ^(†)	6.996	5	34.982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Spares ^(†)	9.742	3	29.227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electronic Equipment Unit (EEU) ^(†)	20.914	5	104.572	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electronic Equipment Unit (EEU) Modification Kit ^(†)	4.850	5	24.248	-	-	-	2.709	1	2.709	2.979	2	5.957	-	-	-	2.979	2	5.957
Float Antenna Equipment Unit (AEU) ^(†)	62.019	1	62.019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Float Cooling Equipment Unit (CEU) ^(†)	12.929	2	25.857	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019					
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17						P-1 Line Item Number / Title: MD11 / BMDS Sensors						Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars					
ID Code (A=Service Ready, B=Not Service Ready) : A												MDAP/MAIS Code:					

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Float Electronic Equipment Unit (EEU) ^(†)	21.491	2	42.982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Forward-Based Mode Prime Power Units (PPU) ^(†)	10.985	4	43.940	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prime Power Unit (PPUs - 2 each radar system) ^(†)	14.109	5	70.545	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Radar Field Upgrade (RAFU) Kit ^(†)	1.450	1	1.450	-	-	-	1.498	1	1.498	1.610	2	3.220	-	-	-	1.610	2	3.220
Transmit/Receive Integrated Microwave Module (TRIMMs) ^(†)	59.840	1	59.840	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Recurring Cost</i>	-	-	1,158.728	-	-	11.947	-	-	13.185	-	-	10.046	-	-	-	-	-	10.046
Non Recurring Cost																		
Contractor Certification ^(†)	2.862	1	2.862	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Non Recurring Cost</i>	-	-	2.862	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Hardware Cost</i>	-	-	1,161.590	-	-	11.947	-	-	13.185	-	-	10.046	-	-	-	-	-	10.046
Support Cost																		
Program Support*	16.000	1	16.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Support Cost</i>	-	-	16.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Cost	235.518	5	1,177.590	0.000	-	11.947	0.000	-	13.185	-	-	10.046	-	-	-	-	-	10.046

Remarks:
AN/TPY-2 Radar consists of one Antenna Equipment Unit (AEU), one Cooling Equipment Unit (CEU), one Electronic Equipment Unit (EEU) and two Prime Power Units (PPUs).

^(†) indicates the presence of a P-5a

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency								Date: March 2019				
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17			P-1 Line Item Number / Title: MD11 / BMDS Sensors					Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars				
Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty (Each)	Unit Cost (\$ M)	Specs Avail Now?	Date Revision Available	RFP Issue Date
Antenna Equipment Unit (AEU) ^(†)		2010	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Jun 2010	Dec 2012	1	144.290	Y		
Antenna Equipment Unit (AEU) ^(†)		2012	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2011	Jun 2014	2	144.090	Y		
Antenna Equipment Unit (AEU) - 1 ^(†)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2012	Jun 2015	1	126.400	Y		
Antenna Equipment Unit (AEU) - 2 ^(†)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2013	Jun 2016	1	126.400	Y		
Antenna Equipment Unit (AEU) Transformer ^(†)		2015	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2014	Sep 2015	3	1.775	Y		
Antenna Equipment Unit (AEU) Transformer ^(†)		2016	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2015	Sep 2016	1	0.410	Y		
Antenna Equipment Unit (AEU) Transformer ^(†)		2017	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2016	Sep 2017	1	0.919	Y		
Antenna Equipment Unit (AEU) Transformer ^(†)		2018	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2017	Sep 2018	1	0.947	Y		
Antenna Equipment Unit (AEU) Transformer ^(†)		2019	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2018	Sep 2019	1	0.978	Y		
Antenna Equipment Unit (AEU) Transformer ^(†)		2020	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2019	Sep 2020	1	0.869	N		
COBRA DANE Transmitter Group Replacement ^(†)		2018	Raytheon / Washington, D.C.	C / IDIQ	MDA, Huntsville, AL	Apr 2018	Apr 2019	1	11.000	Y		
COBRA DANE Transmitter Group Replacement ^(†)		2019	Raytheon / Washington, D.C.	C / IDIQ	MDA, Huntsville, AL	Jun 2019	Jun 2020	1	8.000	Y		
Cooling Equipment Unit (CEU) ^(†)		2010	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Jun 2010	Dec 2012	1	7.800	Y		
Cooling Equipment Unit (CEU) ^(†)		2012	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2011	Jun 2014	2	7.668	Y		
Cooling Equipment Unit (CEU) - 1 ^(†)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2012	Jun 2015	1	6.802	Y		
Cooling Equipment Unit (CEU) - 2 ^(†)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2013	Jun 2016	1	6.802	Y		
Critical Spares ^(†)		2014	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	May 2014	May 2015	1	14.361	Y		
Critical Spares ^(†)		2015	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2014	Dec 2015	1	11.391	Y		
Critical Spares ^(†)		2016	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2015	Dec 2016	1	3.475	Y		
Electronic Equipment Unit (EEU) ^(†)		2010	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Jun 2010	Dec 2012	1	23.400	Y		
Electronic Equipment Unit (EEU) ^(†)		2012	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2011	Jun 2014	2	23.000	Y		

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency								Date: March 2019				
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17			P-1 Line Item Number / Title: MD11 / BMDS Sensors					Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars				
Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty (Each)	Unit Cost (\$ M)	Specs Avail Now?	Date Revision Available	RFP Issue Date
Electronic Equipment Unit (EEU) - 1 ^(t)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2012	Jun 2015	1	20.220	Y		
Electronic Equipment Unit (EEU) - 2 ^(t)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2013	Jun 2016	1	20.220	Y		
Electronic Equipment Unit (EEU) Modification Kit ^(t)		2015	Raytheon / Woburn, MA	SS / FFP	M	Dec 2014	Jun 2015	3	2.795	Y		
Electronic Equipment Unit (EEU) Modification Kit ^(t)		2016	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Mar 2016	Sep 2016	1	3.183	Y		
Electronic Equipment Unit (EEU) Modification Kit ^(t)		2017	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2016	Jun 2017	1	3.134	Y		
Electronic Equipment Unit (EEU) Modification Kit ^(t)		2019	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2018	Jun 2019	1	2.709	Y		
Electronic Equipment Unit (EEU) Modification Kit ^(t)		2020	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2019	Jun 2020	2	2.979	Y		
Float Antenna Equipment Unit (AEU) ^(t)		2016	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2015	Jun 2018	1	62.019	Y		
Float Cooling Equipment Unit (CEU) ^(t)		2012	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2011	Jun 2014	1	7.140	Y		
Float Cooling Equipment Unit (CEU) ^(t)		2014	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Sep 2014	Dec 2015	1	18.721	Y		
Float Electronic Equipment Unit (EEU) ^(t)		2012	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2011	Jun 2014	1	20.260	Y		
Float Electronic Equipment Unit (EEU) ^(t)		2014	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Sep 2014	Sep 2016	1	22.718	Y		
Forward-Based Mode Prime Power Units (PPU) ^(t)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2012	Dec 2014	4	10.985	Y		
Prime Power Unit (PPUs - 2 each radar system) ^(t)		2010	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Jun 2010	Dec 2012	1	15.600	Y		
Prime Power Unit (PPUs - 2 each radar system) ^(t)		2012	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2011	Jun 2014	2	15.336	Y		
Prime Power Unit (PPUs - 2 each radar system) - 1 ^(t)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2012	Jun 2015	1	13.895	Y		
Prime Power Unit (PPUs - 2 each radar system) - 2 ^(t)		2013	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2013	Jun 2016	1	13.895	Y		
Radar Field Upgrade (RAFU) Kit ^(t)		2017	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2016	Jun 2017	1	1.450	Y		

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty <i>(Each)</i>	Unit Cost <i>(\$ M)</i>	Specs Avail Now?	Date Revision Available	RFP Issue Date
Radar Field Upgrade (RAFU) Kit		2019	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2018	Jun 2019	1	1.498	Y		
Radar Field Upgrade (RAFU) Kit		2020	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2019	Jun 2020	2	1.610	Y		
Transmit/Receive Integrated Microwave Module (TRIMMs) ^(†)		2015	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2014	Jun 2016	1	59.840	Y		
Contractor Certification ^(†)		2015	Raytheon / Woburn, MA	SS / FFP	MDA, Huntsville, AL	Dec 2014	Dec 2015	1	2.862	Y		

^(†) indicates the presence of a P-21

Remarks:
N/A

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17 **P-1 Line Item Number / Title:** MD11 / BMDS Sensors **Item Number / Title [DODIC]:** BMDS AN/TPY-2 Radars

Cost Elements <i>(Units in Each)</i>							Fiscal Year 2010														Fiscal Year 2011														BALANCE
OC	MFR #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2009	BAL DUE AS OF 1 OCT	Calendar Year 2010														Calendar Year 2011														
							OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP					
Antenna Equipment Unit (AEU)																																			
	1	2010	MDA	1	0	1																							1						
	1	2012	MDA	2	0	2																							2						
Antenna Equipment Unit (AEU) - 1																																			
	1	2013	MDA	1	0	1																							1						
Antenna Equipment Unit (AEU) - 2																																			
	1	2013	MDA	1	0	1																							1						
Antenna Equipment Unit (AEU) Transformer																																			
	2	2015	MDA	3	0	3																							3						
	2	2016	MDA	1	0	1																							1						
	2	2017	MDA	1	0	1																							1						
	2	2018	MDA	1	0	1																							1						
	2	2019	MDA	1	0	1																							1						
	2	2020	MDA	1	0	1																							1						
COBRA DANE Transmitter Group Replacement																																			
	3	2018	MDA	1	0	1																							1						
	3	2019	MDA	1	0	1																							1						
Cooling Equipment Unit (CEU)																																			
	4	2010	MDA	1	0	1																							1						
	4	2012	MDA	2	0	2																							2						
Cooling Equipment Unit (CEU) - 1																																			
	4	2013	MDA	1	0	1																							1						
Cooling Equipment Unit (CEU) - 2																																			
	4	2013	MDA	1	0	1																							1						
Critical Spares																																			
	5	2014	MDA	1	0	1																							1						
	5	2015	MDA	1	0	1																							1						
	5	2016	MDA	1	0	1																							1						
Electronic Equipment Unit (EEU)																																			
	6	2010	MDA	1	0	1																							1						
	6	2012	MDA	2	0	2																							2						
Electronic Equipment Unit (EEU) - 1																																			
	6	2013	MDA	1	0	1																							1						
							OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2010													Fiscal Year 2011													BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2009	BAL DUE AS OF 1 OCT	Calendar Year 2010													Calendar Year 2011													
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			
Electronic Equipment Unit (EEU) - 2																																	
	6	2013	MDA	1	0	1																							1				
Electronic Equipment Unit (EEU) Modification Kit																																	
	7	2015	MDA	3	0	3																							3				
	7	2016	MDA	1	0	1																							1				
	7	2017	MDA	1	0	1																							1				
	7	2019	MDA	1	0	1																							1				
	7	2020	MDA	2	0	2																							2				
Float Antenna Equipment Unit (AEU)																																	
	8	2016	MDA	1	0	1																							1				
Float Cooling Equipment Unit (CEU)																																	
	9	2012	MDA	1	0	1																							1				
	9	2014	MDA	1	0	1																							1				
Float Electronic Equipment Unit (EEU)																																	
	10	2012	MDA	1	0	1																							1				
	10	2014	MDA	1	0	1																							1				
Forward-Based Mode Prime Power Units (PPU)																																	
	11	2013	MDA	4	0	4																							4				
Prime Power Unit (PPUs - 2 each radar system)																																	
	12	2010	MDA	1	0	1																							1				
	12	2012	MDA	2	0	2																							2				
Prime Power Unit (PPUs - 2 each radar system) - 1																																	
	12	2013	MDA	1	0	1																							1				
Prime Power Unit (PPUs - 2 each radar system) - 2																																	
	12	2013	MDA	1	0	1																							1				
Radar Field Upgrade (RAFU) Kit																																	
	13	2017	MDA	1	0	1																							1				
Transmit/Receive Integrated Microwave Module (TRIMMs)																																	
	14	2015	MDA	1	0	1																							1				
Contractor Certification																																	
	15	2015	MDA	1	0	1																							1				
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2012														Fiscal Year 2013														BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2011	BAL DUE AS OF 1 OCT	Calendar Year 2012														Calendar Year 2013														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Antenna Equipment Unit (AEU)																																			
	1	2010	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1			0				
	1	2012	MDA	2	0	2				A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2				
Antenna Equipment Unit (AEU) - 1																																			
	1	2013	MDA	1	0	1																					A	-	-	-	-	1			
Antenna Equipment Unit (AEU) - 2																																			
	1	2013	MDA	1	0	1																									1				
Antenna Equipment Unit (AEU) Transformer																																			
	2	2015	MDA	3	0	3																									3				
	2	2016	MDA	1	0	1																									1				
	2	2017	MDA	1	0	1																									1				
	2	2018	MDA	1	0	1																									1				
	2	2019	MDA	1	0	1																									1				
	2	2020	MDA	1	0	1																									1				
COBRA DANE Transmitter Group Replacement																																			
	3	2018	MDA	1	0	1																									1				
	3	2019	MDA	1	0	1																									1				
Cooling Equipment Unit (CEU)																																			
	4	2010	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1			0				
	4	2012	MDA	2	0	2				A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2				
Cooling Equipment Unit (CEU) - 1																																			
	4	2013	MDA	1	0	1																					A	-	-	-	-	1			
Cooling Equipment Unit (CEU) - 2																																			
	4	2013	MDA	1	0	1																									1				
Critical Spares																																			
	5	2014	MDA	1	0	1																									1				
	5	2015	MDA	1	0	1																									1				
	5	2016	MDA	1	0	1																									1				
Electronic Equipment Unit (EEU)																																			
	6	2010	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1			0				
	6	2012	MDA	2	0	2				A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2				
Electronic Equipment Unit (EEU) - 1																																			
	6	2013	MDA	1	0	1																					A	-	-	-	-	1			
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2012														Fiscal Year 2013														BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2011	BAL DUE AS OF 1 OCT	Calendar Year 2012														Calendar Year 2013														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Electronic Equipment Unit (EEU) - 2																																			
	6	2013	MDA	1	0	1																							1						
Electronic Equipment Unit (EEU) Modification Kit																																			
	7	2015	MDA	3	0	3																							3						
	7	2016	MDA	1	0	1																							1						
	7	2017	MDA	1	0	1																							1						
	7	2019	MDA	1	0	1																							1						
	7	2020	MDA	2	0	2																							2						
Float Antenna Equipment Unit (AEU)																																			
	8	2016	MDA	1	0	1																							1						
Float Cooling Equipment Unit (CEU)																																			
	9	2012	MDA	1	0	1				A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1						
	9	2014	MDA	1	0	1																							1						
Float Electronic Equipment Unit (EEU)																																			
	10	2012	MDA	1	0	1				A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1						
	10	2014	MDA	1	0	1																							1						
Forward-Based Mode Prime Power Units (PPU)																																			
	11	2013	MDA	4	0	4																							4						
Prime Power Unit (PPUs - 2 each radar system)																																			
	12	2010	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0						
	12	2012	MDA	2	0	2				A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2						
Prime Power Unit (PPUs - 2 each radar system) - 1																																			
	12	2013	MDA	1	0	1																							1						
Prime Power Unit (PPUs - 2 each radar system) - 2																																			
	12	2013	MDA	1	0	1																							1						
Radar Field Upgrade (RAFU) Kit																																			
	13	2017	MDA	1	0	1																							1						
Transmit/Receive Integrated Microwave Module (TRIMMs)																																			
	14	2015	MDA	1	0	1																							1						
Contractor Certification																																			
	15	2015	MDA	1	0	1																							1						
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2014												Fiscal Year 2015												BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2013	BAL DUE AS OF 1 OCT	Calendar Year 2014												Calendar Year 2015												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
Antenna Equipment Unit (AEU)																															
	1	2010	MDA	1	1	0																							0		
	1	2012	MDA	2	0	2	-	-	-	-	-	-	-	-	-	2													0		
Antenna Equipment Unit (AEU) - 1																															
	1	2013	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1		0		
Antenna Equipment Unit (AEU) - 2																															
	1	2013	MDA	1	0	1			A -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1		
Antenna Equipment Unit (AEU) Transformer																															
	2	2015	MDA	3	0	3																							0		
	2	2016	MDA	1	0	1																							1		
	2	2017	MDA	1	0	1																							1		
	2	2018	MDA	1	0	1																							1		
	2	2019	MDA	1	0	1																							1		
	2	2020	MDA	1	0	1																							1		
COBRA DANE Transmitter Group Replacement																															
	3	2018	MDA	1	0	1																							1		
	3	2019	MDA	1	0	1																							1		
Cooling Equipment Unit (CEU)																															
	4	2010	MDA	1	1	0																							0		
	4	2012	MDA	2	0	2	-	-	-	-	-	-	-	-	-	2													0		
Cooling Equipment Unit (CEU) - 1																															
	4	2013	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1		0		
Cooling Equipment Unit (CEU) - 2																															
	4	2013	MDA	1	0	1			A -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1		
Critical Spares																															
	5	2014	MDA	1	0	1										A -	-	-	-	-	-	-	-	-	-	-	1		0		
	5	2015	MDA	1	0	1																							1		
	5	2016	MDA	1	0	1																							1		
Electronic Equipment Unit (EEU)																															
	6	2010	MDA	1	1	0																							0		
	6	2012	MDA	2	0	2	-	-	-	-	-	-	-	-	-	2													0		
Electronic Equipment Unit (EEU) - 1																															
	6	2013	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1		0		
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>					Fiscal Year 2014													Fiscal Year 2015													BALANCE		
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEP T PRIOR TO 1 OCT 2013	BAL DUE AS OF 1 OCT	Calendar Year 2014													Calendar Year 2015													
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			
Electronic Equipment Unit (EEU) - 2																																	
	6	2013	MDA	1	0	1				A -																			1				
Electronic Equipment Unit (EEU) Modification Kit																																	
	7	2015	MDA	3	0	3																							0				
	7	2016	MDA	1	0	1																							1				
	7	2017	MDA	1	0	1																							1				
	7	2019	MDA	1	0	1																							1				
	7	2020	MDA	2	0	2																							2				
Float Antenna Equipment Unit (AEU)																																	
	8	2016	MDA	1	0	1																							1				
Float Cooling Equipment Unit (CEU)																																	
	9	2012	MDA	1	0	1	-	-	-	-	-	-	-	-	1														0				
	9	2014	MDA	1	0	1														A -	-	-	-	-	-	-	-	-	1				
Float Electronic Equipment Unit (EEU)																																	
	10	2012	MDA	1	0	1	-	-	-	-	-	-	-	-	1														0				
	10	2014	MDA	1	0	1														A -	-	-	-	-	-	-	-	-	1				
Forward-Based Mode Prime Power Units (PPU)																																	
	11	2013	MDA	4	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1					
Prime Power Unit (PPUs - 2 each radar system)																																	
	12	2010	MDA	1	1	0																						0					
	12	2012	MDA	2	0	2	-	-	-	-	-	-	-	-	2													0					
Prime Power Unit (PPUs - 2 each radar system) - 1																																	
	12	2013	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0					
Prime Power Unit (PPUs - 2 each radar system) - 2																																	
	12	2013	MDA	1	0	1				A -																		1					
Radar Field Upgrade (RAFU) Kit																																	
	13	2017	MDA	1	0	1																						1					
Transmit/Receive Integrated Microwave Module (TRIMMs)																																	
	14	2015	MDA	1	0	1																						1					
Contractor Certification																																	
	15	2015	MDA	1	0	1																						1					
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2016														Fiscal Year 2017														BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2015	BAL DUE AS OF 1 OCT	Calendar Year 2016														Calendar Year 2017														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Antenna Equipment Unit (AEU)																																			
	1	2010	MDA	1	1	0																							0						
	1	2012	MDA	2	2	0																							0						
Antenna Equipment Unit (AEU) - 1																																			
	1	2013	MDA	1	1	0																							0						
Antenna Equipment Unit (AEU) - 2																																			
	1	2013	MDA	1	0	1	-	-	-	-	-	-	-	-	-	1													0						
Antenna Equipment Unit (AEU) Transformer																																			
	2	2015	MDA	3	3	0																							0						
	2	2016	MDA	1	0	1																							0						
	2	2017	MDA	1	0	1																							0						
	2	2018	MDA	1	0	1																							1						
	2	2019	MDA	1	0	1																							1						
	2	2020	MDA	1	0	1																							1						
COBRA DANE Transmitter Group Replacement																																			
	3	2018	MDA	1	0	1																							1						
	3	2019	MDA	1	0	1																							1						
Cooling Equipment Unit (CEU)																																			
	4	2010	MDA	1	1	0																							0						
	4	2012	MDA	2	2	0																							0						
Cooling Equipment Unit (CEU) - 1																																			
	4	2013	MDA	1	1	0																							0						
Cooling Equipment Unit (CEU) - 2																																			
	4	2013	MDA	1	0	1	-	-	-	-	-	-	-	-	-	1													0						
Critical Spares																																			
	5	2014	MDA	1	1	0																							0						
	5	2015	MDA	1	0	1																							0						
	5	2016	MDA	1	0	1																							0						
Electronic Equipment Unit (EEU)																																			
	6	2010	MDA	1	1	0																							0						
	6	2012	MDA	2	2	0																							0						
Electronic Equipment Unit (EEU) - 1																																			
	6	2013	MDA	1	1	0																							0						
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>					Fiscal Year 2016													Fiscal Year 2017													BALANCE		
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2015	BAL DUE AS OF 1 OCT	Calendar Year 2016													Calendar Year 2017													
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			
Electronic Equipment Unit (EEU) - 2																																	
	6	2013	MDA	1	0	1	-	-	-	-	-	-	-	-	-	1													0				
Electronic Equipment Unit (EEU) Modification Kit																																	
	7	2015	MDA	3	3	0																							0				
	7	2016	MDA	1	0	1																							0				
	7	2017	MDA	1	0	1																							0				
	7	2019	MDA	1	0	1																							1				
	7	2020	MDA	2	0	2																							2				
Float Antenna Equipment Unit (AEU)																																	
	8	2016	MDA	1	0	1																							1				
Float Cooling Equipment Unit (CEU)																																	
	9	2012	MDA	1	1	0																							0				
	9	2014	MDA	1	0	1	-	-	1																				0				
Float Electronic Equipment Unit (EEU)																																	
	10	2012	MDA	1	1	0																							0				
	10	2014	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	1												0				
Forward-Based Mode Prime Power Units (PPU)																																	
	11	2013	MDA	4	3	1																							1				
Prime Power Unit (PPUs - 2 each radar system)																																	
	12	2010	MDA	1	1	0																							0				
	12	2012	MDA	2	2	0																							0				
Prime Power Unit (PPUs - 2 each radar system) - 1																																	
	12	2013	MDA	1	1	0																							0				
Prime Power Unit (PPUs - 2 each radar system) - 2																																	
	12	2013	MDA	1	0	1	-	-	-	-	-	-	-	-	-	1													0				
Radar Field Upgrade (RAFU) Kit																																	
	13	2017	MDA	1	0	1																							0				
Transmit/Receive Integrated Microwave Module (TRIMMs)																																	
	14	2015	MDA	1	0	1	-	-	-	-	-	-	-	-	-	1													0				
Contractor Certification																																	
	15	2015	MDA	1	0	1	-	-	1																				0				
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>							Fiscal Year 2018														Fiscal Year 2019														BALANCE
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2017	BAL DUE AS OF 1 OCT	Calendar Year 2018														Calendar Year 2019														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Antenna Equipment Unit (AEU)																																			
	1	2010	MDA	1	1	0																							0						
	1	2012	MDA	2	2	0																							0						
Antenna Equipment Unit (AEU) - 1																																			
	1	2013	MDA	1	1	0																							0						
Antenna Equipment Unit (AEU) - 2																																			
	1	2013	MDA	1	1	0																							0						
Antenna Equipment Unit (AEU) Transformer																																			
	2	2015	MDA	3	3	0																							0						
	2	2016	MDA	1	1	0																							0						
	2	2017	MDA	1	1	0																							0						
	2	2018	MDA	1	0	1				A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0						
	2	2019	MDA	1	0	1																							0						
	2	2020	MDA	1	0	1																							1						
COBRA DANE Transmitter Group Replacement																																			
	3	2018	MDA	1	0	1																							0						
	3	2019	MDA	1	0	1																							1						
Cooling Equipment Unit (CEU)																																			
	4	2010	MDA	1	1	0																							0						
	4	2012	MDA	2	2	0																							0						
Cooling Equipment Unit (CEU) - 1																																			
	4	2013	MDA	1	1	0																							0						
Cooling Equipment Unit (CEU) - 2																																			
	4	2013	MDA	1	1	0																							0						
Critical Spares																																			
	5	2014	MDA	1	1	0																							0						
	5	2015	MDA	1	1	0																							0						
	5	2016	MDA	1	1	0																							0						
Electronic Equipment Unit (EEU)																																			
	6	2010	MDA	1	1	0																							0						
	6	2012	MDA	2	2	0																							0						
Electronic Equipment Unit (EEU) - 1																																			
	6	2013	MDA	1	1	0																							0						
							O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S					
							C	O	E	A	E	A	A	A	U	U	A	E	C	O	V	E	A	E	A	A	U	U	A	S					
							T	V	C	N	B	R	P	Y	N	L	G	P	T	V	C	N	B	R	P	Y	N	L	G	P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2018													Fiscal Year 2019													BALANCE	
O C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2017	BAL DUE AS OF 1 OCT	Calendar Year 2018													Calendar Year 2019													
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			
Electronic Equipment Unit (EEU) - 2																																	
	6	2013	MDA	1	1	0																							0				
Electronic Equipment Unit (EEU) Modification Kit																																	
	7	2015	MDA	3	3	0																							0				
	7	2016	MDA	1	1	0																							0				
	7	2017	MDA	1	1	0																							0				
	7	2019	MDA	1	0	1																							0				
	7	2020	MDA	2	0	2																							2				
Float Antenna Equipment Unit (AEU)																																	
	8	2016	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0				
Float Cooling Equipment Unit (CEU)																																	
	9	2012	MDA	1	1	0																							0				
	9	2014	MDA	1	1	0																							0				
Float Electronic Equipment Unit (EEU)																																	
	10	2012	MDA	1	1	0																							0				
	10	2014	MDA	1	1	0																							0				
Forward-Based Mode Prime Power Units (PPU)																																	
	11	2013	MDA	4	3	1																							1				
Prime Power Unit (PPUs - 2 each radar system)																																	
	12	2010	MDA	1	1	0																							0				
	12	2012	MDA	2	2	0																							0				
Prime Power Unit (PPUs - 2 each radar system) - 1																																	
	12	2013	MDA	1	1	0																							0				
Prime Power Unit (PPUs - 2 each radar system) - 2																																	
	12	2013	MDA	1	1	0																							0				
Radar Field Upgrade (RAFU) Kit																																	
	13	2017	MDA	1	1	0																							0				
Transmit/Receive Integrated Microwave Module (TRIMMs)																																	
	14	2015	MDA	1	1	0																							0				
Contractor Certification																																	
	15	2015	MDA	1	1	0																							0				
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>							Fiscal Year 2020														Fiscal Year 2021														BALANCE
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2019	BAL DUE AS OF 1 OCT	Calendar Year 2020														Calendar Year 2021														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Antenna Equipment Unit (AEU)																																			
	1	2010	MDA	1	1	0																							0						
	1	2012	MDA	2	2	0																							0						
Antenna Equipment Unit (AEU) - 1																																			
	1	2013	MDA	1	1	0																							0						
Antenna Equipment Unit (AEU) - 2																																			
	1	2013	MDA	1	1	0																							0						
Antenna Equipment Unit (AEU) Transformer																																			
	2	2015	MDA	3	3	0																							0						
	2	2016	MDA	1	1	0																							0						
	2	2017	MDA	1	1	0																							0						
	2	2018	MDA	1	1	0																							0						
	2	2019	MDA	1	1	0																							0						
	2	2020	MDA	1	0	1																							0						
COBRA DANE Transmitter Group Replacement																																			
	3	2018	MDA	1	1	0																							0						
	3	2019	MDA	1	0	1																							0						
Cooling Equipment Unit (CEU)																																			
	4	2010	MDA	1	1	0																							0						
	4	2012	MDA	2	2	0																							0						
Cooling Equipment Unit (CEU) - 1																																			
	4	2013	MDA	1	1	0																							0						
Cooling Equipment Unit (CEU) - 2																																			
	4	2013	MDA	1	1	0																							0						
Critical Spares																																			
	5	2014	MDA	1	1	0																							0						
	5	2015	MDA	1	1	0																							0						
	5	2016	MDA	1	1	0																							0						
Electronic Equipment Unit (EEU)																																			
	6	2010	MDA	1	1	0																							0						
	6	2012	MDA	2	2	0																							0						
Electronic Equipment Unit (EEU) - 1																																			
	6	2013	MDA	1	1	0																							0						
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD11 / BMDS Sensors	Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2020													Fiscal Year 2021													BALANCE	
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2019	BAL DUE AS OF 1 OCT	Calendar Year 2020													Calendar Year 2021													
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			
Electronic Equipment Unit (EEU) - 2																																	
	6	2013	MDA	1	1	0																							0				
Electronic Equipment Unit (EEU) Modification Kit																																	
	7	2015	MDA	3	3	0																							0				
	7	2016	MDA	1	1	0																							0				
	7	2017	MDA	1	1	0																							0				
	7	2019	MDA	1	1	0																							0				
	7	2020	MDA	2	0	2																							0				
Float Antenna Equipment Unit (AEU)																																	
	8	2016	MDA	1	1	0																							0				
Float Cooling Equipment Unit (CEU)																																	
	9	2012	MDA	1	1	0																							0				
	9	2014	MDA	1	1	0																							0				
Float Electronic Equipment Unit (EEU)																																	
	10	2012	MDA	1	1	0																							0				
	10	2014	MDA	1	1	0																							0				
Forward-Based Mode Prime Power Units (PPU)																																	
	11	2013	MDA	4	3	1																							1				
Prime Power Unit (PPUs - 2 each radar system)																																	
	12	2010	MDA	1	1	0																							0				
	12	2012	MDA	2	2	0																							0				
Prime Power Unit (PPUs - 2 each radar system) - 1																																	
	12	2013	MDA	1	1	0																							0				
Prime Power Unit (PPUs - 2 each radar system) - 2																																	
	12	2013	MDA	1	1	0																							0				
Radar Field Upgrade (RAFU) Kit																																	
	13	2017	MDA	1	1	0																							0				
Transmit/Receive Integrated Microwave Module (TRIMMs)																																	
	14	2015	MDA	1	1	0																							0				
Contractor Certification																																	
	15	2015	MDA	1	1	0																							0				
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P			

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17		P-1 Line Item Number / Title: MD11 / BMDS Sensors
		Item Number / Title [DODIC]: BMDS AN/TPY-2 Radars

MFR Ref #	Manufacturer Name - Location	Production Rates (Each / Month)			Procurement Leadtime (Months)							
		MSR For 2020	1-8-5 For 2020	MAX For 2020	Initial				Reorder			
					ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1	ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1
1	Raytheon - Woburn, MA	1	1	4	4	3	30	33	0	0	0	0
2	Raytheon - Woburn, MA	1	4	4	2	3	9	12	2	3	9	12
3	Raytheon - Washington, D.C.	1	1	1	3	2	12	14	3	2	12	14
4	Raytheon - Woburn, MA	1	1	4	4	2	30	32	0	0	0	0
5	Raytheon - Woburn, MA	1	1	4	4	2	12	14	4	2	12	14
6	Raytheon - Woburn, MA	1	1	4	4	2	30	32	0	0	0	0
7	Raytheon - Woburn, MA	1	2	4	2	3	6	9	2	3	6	9
8	Raytheon - Woburn, MA	1	1	4	4	2	30	32	0	0	0	0
9	Raytheon - Woburn, MA	1	1	4	4	2	15	17	0	0	0	0
10	Raytheon - Woburn, MA	1	1	4	4	2	24	26	0	0	0	0
11	Raytheon - Woburn, MA	1	1	4	4	2	24	26	0	0	0	0
12	Raytheon - Woburn, MA	1	1	4	4	2	30	32	0	0	0	0
13	Raytheon - Woburn, MA	1	2	4	2	3	6	9	2	3	6	9
14	Raytheon - Woburn, MA	1	1	4	4	2	18	20	4	2	18	20
15	Raytheon - Woburn, MA	1	1	1	3	2	12	14	3	2	12	14

"A" in the Delivery Schedule indicates the Contract Award Date.

Note: Due to space limitations, quantities in the Exhibit P-21 delivery calendar are truncated and rounded based on the maximum quantity in the calendar as follows. If the maximum quantity is less than or equal to than 9,999, all quantities are shown as each. If the maximum quantity is between 10,000 and 999,999 all quantities are shown in thousands. If the maximum quantity is between 1,000,000 and 999,999,999 all quantities are shown in millions (rounded to the nearest thousand). If the maximum quantity is equal or greater than 1,000,000,000 all quantities are shown in billions (rounded to the nearest million).

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD26 / Arrow 3 Upper Tier System
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: N/A	Other Related Program Elements: N/A
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	2	1	1	1	-	1	1	1	1	1	Continuing	Continuing
Gross/Weapon System Cost (<i>\$ in Millions</i>)	135.000	120.000	80.000	55.000	-	55.000	77.000	62.000	90.000	90.000	Continuing	Continuing
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	135.000	120.000	80.000	55.000	-	55.000	77.000	62.000	90.000	90.000	Continuing	Continuing
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	135.000	120.000	80.000	55.000	-	55.000	77.000	62.000	90.000	90.000	Continuing	Continuing

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	67.500	120.000	80.000	55.000	-	55.000	77.000	62.000	90.000	90.000	Continuing	Continuing

Description:

For procurement of Arrow Weapon System components.
Quantities are classified. The unit quantity of one is used as a proxy in each fiscal year with funding.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD26 / Arrow 3 Upper Tier System
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: N/A	Other Related Program Elements: N/A
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Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	Israeli Program Procurement		A		2 / 135.000	1 / 120.000	1 / 80.000	1 / 55.000	- / -	1 / 55.000
P-40	Total Gross/Weapon System Cost				2 / 135.000	1 / 120.000	1 / 80.000	1 / 55.000	- / -	1 / 55.000

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
 For procurement of Arrow Weapon System components.

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD26 / Arrow 3 Upper Tier System	Item Number / Title [DODIC]: Israeli Program Procurement

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (<i>Units in Each</i>)	2	1	1	1	-	1
Gross/Weapon System Cost (<i>\$ in Millions</i>)	135.000	120.000	80.000	55.000	-	55.000
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	135.000	120.000	80.000	55.000	-	55.000
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	135.000	120.000	80.000	55.000	-	55.000

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	67.500	120.000	80.000	55.000	-	55.000

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware Cost																		
Recurring Cost																		
Israeli Programs	67.500	2	135.000	120.000	1	120.000	80.000	1	80.000	55.000	1	55.000	-	-	-	55.000	1	55.000
<i>Subtotal: Recurring Cost</i>	-	-	135.000	-	-	120.000	-	-	80.000	-	-	55.000	-	-	-	-	-	55.000
<i>Subtotal: Hardware Cost</i>	-	-	135.000	-	-	120.000	-	-	80.000	-	-	55.000	-	-	-	-	-	55.000
Gross/Weapon System Cost	67.500	2	135.000	120.000	1	120.000	80.000	1	80.000	55.000	1	55.000	-	-	-	55.000	1	55.000

Remarks:

For procurement of Arrow Weapon System components. Quantities are classified. The unit quantity of one is used as a proxy in each fiscal year with funding.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD34 / Short Range Ballistic Missile Defense (SRBMD) (David's Sling Weapon System (DSWS))
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: N/A	Other Related Program Elements: N/A
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	2	1	1	1	-	1	1	1	1	1	Continuing	Continuing
Gross/Weapon System Cost (<i>\$ in Millions</i>)	300.000	120.000	50.000	50.000	-	50.000	50.000	30.000	30.000	30.000	Continuing	Continuing
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	300.000	120.000	50.000	50.000	-	50.000	50.000	30.000	30.000	30.000	Continuing	Continuing
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	300.000	120.000	50.000	50.000	-	50.000	50.000	30.000	30.000	30.000	Continuing	Continuing

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	150.000	120.000	50.000	50.000	-	50.000	50.000	30.000	30.000	30.000	Continuing	Continuing

Description:

Previously named David's Sling. PB19 name change to Short Range Ballistic Missile Defense (SRBMD).

-Provides funding to the Government of Israel to procure David's Sling Weapon System (DSWS)/Short Range Ballistic Missile Defense (SRBMD) components. Quantities are classified. The unit quantity of one is used as a proxy in each fiscal year with funding.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD34 / Short Range Ballistic Missile Defense (SRBMD) (David's Sling Weapon System (DSWS))
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: N/A	Other Related Program Elements: N/A
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Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	1 / David's Sling Weapon System [1]		A		2 / 300.000	1 / 120.000	1 / 50.000	1 / 50.000	- / -	1 / 50.000
P-40	Total Gross/Weapon System Cost				2 / 300.000	1 / 120.000	1 / 50.000	1 / 50.000	- / -	1 / 50.000

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
 Provides funding to the Government of Israel to procure DSWS/SRBMD components.

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD34 / Short Range Ballistic Missile Defense (SRBMD) (David's Sling Weapon System (DSWS))	Item Number / Title [DODIC]: 1 / David's Sling Weapon System [1]

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	2	1	1	1	-	1
Gross/Weapon System Cost (\$ in Millions)	300.000	120.000	50.000	50.000	-	50.000
Less PY Advance Procurement (\$ in Millions)	0.000	0.000	0.000	-	-	-
Net Procurement (P-1) (\$ in Millions)	300.000	120.000	50.000	50.000	-	50.000
Plus CY Advance Procurement (\$ in Millions)	0.000	0.000	0.000	-	-	-
Total Obligation Authority (\$ in Millions)	300.000	120.000	50.000	50.000	-	50.000

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	150.000	120.000	50.000	50.000	-	50.000

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware Cost																		
Recurring Cost																		
David's Sling Weapon System	150.000	2	300.000	120.000	1	120.000	50.000	1	50.000	50.000	1	50.000	-	-	-	50.000	1	50.000
<i>Subtotal: Recurring Cost</i>	-	-	300.000	-	-	120.000	-	-	50.000	-	-	50.000	-	-	-	-	-	50.000
<i>Subtotal: Hardware Cost</i>	-	-	300.000	-	-	120.000	-	-	50.000	-	-	50.000	-	-	-	-	-	50.000
Gross/Weapon System Cost	150.000	2	300.000	120.000	1	120.000	50.000	1	50.000	50.000	1	50.000	-	-	-	50.000	1	50.000

Remarks:
David's Sling Weapon System/SRBMD component procurement. Quantities are classified. The unit quantity of one is used as a proxy in each fiscal year with Funding.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity:
0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency

P-1 Line Item Number / Title:
MD73 / Aegis Ashore Phase III

ID Code (A=Service Ready, B=Not Service Ready): A **Program Elements for Code B Items:** 0604880C, 0604881C, 0603892C **Other Related Program Elements:** 0604880C

Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	4	1	1	1	-	1	1	-	-	-	-	8
Gross/Weapon System Cost (<i>\$ in Millions</i>)	425.081	74.739	15.000	25.659	-	25.659	12.000	-	-	-	-	552.479
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	425.081	74.739	15.000	25.659	-	25.659	12.000	-	-	-	-	552.479
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	425.081	74.739	15.000	25.659	-	25.659	12.000	-	-	-	-	552.479
<i>(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)</i>												
Initial Spares (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	106.270	74.739	15.000	25.659	-	25.659	12.000	-	-	-	-	69.060

Description:

Note: FY 2018 includes the \$15.000 million enacted Congressional Plus for Aegis Ashore Poland. The increase from FY 2019 to FY 2020 provides European Phased Adaptive Approach (EPAA) Phase III, configuration and test validations. Attributable to Poland Military Construction delays which pushed EPAA Phase III Technical Capability Declaration (TCD) from CY2018 to CY2020.

On 17 December 2009, the President announced an overarching policy to provide regional missile defense to U.S. deployed forces, allies and partners in Europe called the European Phased Adaptive Approach (EPAA). Within this policy, a European PAA specifically addresses 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.

Aegis Ashore provides the Aegis Missile Defense capability against short and medium range ballistic missiles in an ashore configuration. It will be similar to the Aegis At-Sea BMD capability inherent in the new Arleigh Burke-class Aegis destroyers (DDG-113 and following ships) to facilitate training and logistical support by the lead service, Navy. Aegis Ashore re-hosts the required BMD components of a Navy Destroyer in an ashore configuration to include a Deckhouse structure and Weapon System comprised of a SPY AN/SPY-1D(V) radar, Vertical Launch System (VLS), computing infrastructure, Command, Control, Communications, Computers and Intelligence (C4I) systems, and operator consoles. Aegis Ashore can adapt to the threat and can be deployed to other regions as needed to provide persistent coverage for the Geographic Combatant Commanders. Phase III of EPAA (2020) deploys a land based Aegis Ashore in Poland, and introduces an upgraded Standard Missile, the SM-3 Block IIA. This missile brings improved coverage against medium and intermediate range ballistic threats, and extends coverage to the majority of the European continent.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD73 / Aegis Ashore Phase III
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: 0604880C, 0604881C, 0603892C	Other Related Program Elements: 0604880C
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Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	Aegis Ashore Poland, Equipment and Deckhouse		A		4 / 425.081	1 / 74.739	1 / 15.000	1 / 25.659	- / -	1 / 25.659
P-40	Total Gross/Weapon System Cost				4 / 425.081	1 / 74.739	1 / 15.000	1 / 25.659	- / -	1 / 25.659

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:

The Aegis Ashore to be installed in Poland contains a Deckhouse structure and Weapon System comprised of a AN/SPY-1D(V)radar, Vertical Launch System (VLS), computing infrastructure, Command, Control, Communications, Computers and Intelligence (C4I) systems, and operator consoles with very diverse procurement lead times from multiple contracts. The funding profile addresses the multiple actions required to field the Aegis Ashore end item in Poland by the end of the calendar year 2020, 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. MDA uses Research Development, Test, and Evaluation (RDT&E) (Program Element (PE)-0604880C) to modernize, develop and test Aegis Ashore capability improvements at the Aegis Ashore Missile Defense Test Complex (AAMDTC) in Hawaii for implementation at operational sites. Procurement funding provides the following:

- FY 2016 Site activation, fabrication of the Deckhouse structure and assembly of Aegis Ashore Deckhouse structure in Poland.
- FY 2017 Install Aegis Ashore Weapon System in the Aegis Ashore Deckhouse structure in Poland.
- FY 2018 Continue installation of the Aegis Ashore Weapon System in the Aegis Ashore Deckhouse structure in Poland.
- FY 2019 Continue installation of the combat system and combat structure adaptation, integration and installation
- FY 2020 Continue installation of the combat system and combat structure adaptation, integration and installation

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD73 / Aegis Ashore Phase III	Item Number / Title [DODIC]: Aegis Ashore Poland, Equipment and Deckhouse

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (<i>Units in Each</i>)	4	1	1	1	-	1
Gross/Weapon System Cost (<i>\$ in Millions</i>)	425.081	74.739	15.000	25.659	-	25.659
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	425.081	74.739	15.000	25.659	-	25.659
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	425.081	74.739	15.000	25.659	-	25.659

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	106.270	74.739	15.000	25.659	-	25.659

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Flyaway Cost																		
Recurring Cost																		
Aegis Ashore Poland, Equipment and Deckhouse	106.270	4	425.081	74.739	1	74.739	15.000	1	15.000	25.659	1	25.659	-	-	-	25.659	1	25.659
<i>Subtotal: Recurring Cost</i>	-	-	425.081	-	-	74.739	-	-	15.000	-	-	25.659	-	-	-	-	-	25.659
<i>Subtotal: Flyaway Cost</i>	-	-	425.081	-	-	74.739	-	-	15.000	-	-	25.659	-	-	-	-	-	25.659
Gross/Weapon System Cost	106.270	4	425.081	74.739	1	74.739	15.000	1	15.000	25.659	1	25.659	-	-	-	25.659	1	25.659

Remarks:

N/A

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD83 / Iron Dome
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: N/A	Other Related Program Elements: 0603913C
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	6	1	1	1	-	1	1	1	1	1	Continuing	Continuing
Gross/Weapon System Cost (<i>\$ in Millions</i>)	1,311.630	92.000	70.000	95.000	-	95.000	73.000	108.000	80.000	80.000	Continuing	Continuing
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	1,311.630	92.000	70.000	95.000	-	95.000	73.000	108.000	80.000	80.000	Continuing	Continuing
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	1,311.630	92.000	70.000	95.000	-	95.000	73.000	108.000	80.000	80.000	Continuing	Continuing

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	218.605	92.000	70.000	95.000	-	95.000	73.000	108.000	80.000	80.000	Continuing	Continuing

Description:

Provides funding to the Government of Israel to procure Iron Dome batteries and Tamir missiles to counter short-range rocket threats.

Quantities are classified. The unit quantity of one is used as a proxy in each fiscal year with funding.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity:
0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency

P-1 Line Item Number / Title:
MD83 / Iron Dome

ID Code (A=Service Ready, B=Not Service Ready): A **Program Elements for Code B Items:** N/A **Other Related Program Elements:** 0603913C

Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	Iron Dome		A		6 / 1,311.630	1 / 92.000	1 / 70.000	1 / 95.000	- / -	1 / 95.000
P-40	Total Gross/Weapon System Cost				6 / 1,311.630	1 / 92.000	1 / 70.000	1 / 95.000	- / -	1 / 95.000

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
Procurement of additional Iron Dome equipment.

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD83 / Iron Dome	Item Number / Title [DODIC]: Iron Dome

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (<i>Units in Each</i>)	6	1	1	1	-	1
Gross/Weapon System Cost (<i>\$ in Millions</i>)	1,311.630	92.000	70.000	95.000	-	95.000
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	1,311.630	92.000	70.000	95.000	-	95.000
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	1,311.630	92.000	70.000	95.000	-	95.000

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	218.605	92.000	70.000	95.000	-	95.000

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware Cost																		
Recurring Cost																		
Iron Dome	218.605	6	1,311.630	92.000	1	92.000	70.000	1	70.000	95.000	1	95.000	-	-	-	95.000	1	95.000
<i>Subtotal: Recurring Cost</i>	-	-	1,311.630	-	-	92.000	-	-	70.000	-	-	95.000	-	-	-	-	-	95.000
<i>Subtotal: Hardware Cost</i>	-	-	1,311.630	-	-	92.000	-	-	70.000	-	-	95.000	-	-	-	-	-	95.000
Gross/Weapon System Cost	218.605	6	1,311.630	92.000	1	92.000	70.000	1	70.000	95.000	1	95.000	-	-	-	95.000	1	95.000

Remarks:

Procurement of additional Iron Dome equipment. Quantities are classified. The unit quantity of one is used as a proxy in each fiscal year with funding.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: N/A	Other Related Program Elements: N/A
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Line Item MDAP/MAIS Code: 362

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	33	22	28	36	-	36	33	37	36	30	-	255
Gross/Weapon System Cost (<i>\$ in Millions</i>)	188.398	157.070	97.057	124.986	-	124.986	89.024	85.564	101.275	129.690	-	973.064
Less PY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	188.398	157.070	97.057	124.986	-	124.986	89.024	85.564	101.275	129.690	-	973.064
Plus CY Advance Procurement (<i>\$ in Millions</i>)	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	188.398	157.070	97.057	124.986	-	124.986	89.024	85.564	101.275	129.690	-	973.064

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	0.000	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	5.709	7.140	3.466	3.472	-	3.472	2.698	2.313	2.813	4.323	-	3.816

Description:

Note:

FY 2020 Base procurement budget request provides the procurement, installation and deployment of Aegis Ballistic Missile Defense (BMD) material for operational ships and sites. 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.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D: Procurement, Defense-Wide / BA 01: Major Equipment / BSA 17: Major Equipment, Missile Defense Agency	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software
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ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: N/A	Other Related Program Elements: N/A
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Line Item MDAP/MAIS Code: 362

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	Aegis BMD Shipsets	P-5a, P-21	A		33 / 188.398	22 / 157.070	28 / 97.057	36 / 124.986	- / -	36 / 124.986
P-40	Total Gross/Weapon System Cost				33 / 188.398	22 / 157.070	28 / 97.057	36 / 124.986	- / -	36 / 124.986

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
 FY 2020 Base procurement dollars in the amount of \$124.986 million supports the continued procurement and deployment of Aegis BMD capabilities to operational ships and sites. A shipset consists of the procurement of cabinets, cabling, equipment, and other material required for the installation of the BMD baselines on a ship.

Upgrading the 3.6 and 4.0 shipsets to 4.x adds capability and capacity in support of the European Phased Adaptive Approach EPAA Phase II requirements.

Upgrading the 4.x to BL 5.4 (BMD 4.1) delivers a single Aegis Weapon System maximizing a merger of BMD 4.1 and B/L 5.3 computer programs and capturing B/L 7 and 9 capabilities within the current system architecture.

Upgrading the 5.x shipsets adds capability and capacity in support of achieving the European Phased Adaptive Approach EPAA Phase III requirements

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency					Date: March 2019			
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17			P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software			Item Number / Title [DODIC]: Aegis BMD Shipsets		
ID Code (A=Service Ready, B=Not Service Ready) : A				MDAP/MAIS Code:				
Resource Summary			Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)			33	22	28	36	-	36
Gross/Weapon System Cost (\$ in Millions)			188.398	157.070	97.057	124.986	-	124.986
Less PY Advance Procurement (\$ in Millions)			0.000	0.000	0.000	-	-	-
Net Procurement (P-1) (\$ in Millions)			188.398	157.070	97.057	124.986	-	124.986
Plus CY Advance Procurement (\$ in Millions)			0.000	0.000	0.000	-	-	-
Total Obligation Authority (\$ in Millions)			188.398	157.070	97.057	124.986	-	124.986
<i>(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)</i>								
Initial Spares (\$ in Millions)			-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)			5.709	7.140	3.466	3.472	-	3.472

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware Cost																		
Recurring Cost																		
Aegis BL 5.4 (4.2) Hardware Procurement	-	-	-	-	-	-	-	-	-	51.996	1	51.996	-	-	-	51.996	1	51.996
Aegis BL 5.4 (BMD 4.1) Installs ^(†)	-	-	-	-	-	-	0.615	3	1.845	0.633	5	3.163	-	-	-	0.633	5	3.163
Aegis BL 5.4 (BMD4.1) Procurement ^(†)	-	-	-	-	-	-	0.162	10	1.620	0.324	8	2.592	-	-	-	0.324	8	2.592
Aegis BL 9.C1 (5.0 CU) Installs	1.400	1	1.400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aegis BL 9.C2 (BMD 5.1) BackFit Installs ^(†)	1.133	3	3.400	1.051	8	8.408	1.485	3	4.455	1.163	2	2.326	-	-	-	1.163	2	2.326
Aegis BL 9.C2 (BMD 5.1) BackFit Procurement ^(†)	2.194	17	37.297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aegis BL 9.C2 (BMD 5.1) Inline Installs ^(†)	3.310	1	3.310	1.237	3	3.712	1.499	1	1.499	2.190	3	6.570	-	-	-	2.190	3	6.570
Aegis BL 9.C2 (BMD 5.1) Inline Procurements ^(†)	4.505	3	13.516	3.739	3	11.217	4.325	3	12.975	3.871	3	11.613	-	-	-	3.871	3	11.613
Aegis BMD 3.6 to 4.X Hardware Procurements ^(†)	12.668	7	88.675	15.506	3	46.518	17.451	1	17.451	-	-	-	-	-	-	-	-	-

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Exhibit P-5, Cost Analysis: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
ID Code (A=Service Ready, B=Not Service Ready) : A		MDAP/MAIS Code:

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Aegis BMD 3.6 to 4.X Installs ^(†)	18.800	2	37.600	17.443	5	87.215	18.215	3	54.645	24.482	1	24.482	-	-	-	24.482	1	24.482
Aegis BMD TI-12H Upgrade Procurement	-	-	-	-	-	-	-	-	-	3.420	5	17.099	-	-	-	3.420	5	17.099
<i>Subtotal: Recurring Cost</i>	-	-	185.198	-	-	157.070	-	-	94.490	-	-	119.841	-	-	-	-	-	119.841
<i>Subtotal: Hardware Cost</i>	-	-	185.198	-	-	157.070	-	-	94.490	-	-	119.841	-	-	-	-	-	119.841
Software Cost																		
Recurring Cost																		
Aegis BL 9.B/C2 (BMD 5.1) Software Upgrade Installs ^(†)	-	-	-	-	-	-	0.642	4	2.567	0.643	8	5.145	-	-	-	0.643	8	5.145
Aegis BMD 4.0 to 4.X Software Installs	0.533	6	3.200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Recurring Cost</i>	-	-	3.200	-	-	-	-	-	2.567	-	-	5.145	-	-	-	-	-	5.145
<i>Subtotal: Software Cost</i>	-	-	3.200	-	-	-	-	-	2.567	-	-	5.145	-	-	-	-	-	5.145
Gross/Weapon System Cost	5.709	33	188.398	7.140	22	157.070	3.466	28	97.057	3.472	36	124.986	-	-	-	3.472	36	124.986

Remarks:

The Aegis BL 9.C2 (BMD 5.1) upgrade provides EPAA Phase III integrated Air and Aegis BMD mission capability. The Aegis BL 9.C2 (BMD 5.1) Inline procurement/installation upgrades non-BMD capable ships to full Aegis BL 9.C2 (BMD 5.1) capability. Unit costs for Aegis BL 9.C2 (BMD 5.1) Inline Procurements is dependent on specific ship configuration. These unit costs are averaged in the years where there is a mix of ship configurations and will result in unit cost fluctuations year to year.

The Aegis BL 9.C2 (BMD 5.1) Backfit Procurement upgrade consists of an Aegis Weapon System, Command/Control/Communication and Vertical Launching System hardware necessary to upgrade an in-service Aegis BL 9.C1 (BMD 5.0CU) capable ship to BL 9.C2 (BMD 5.1).

The Aegis BL 9.C2 (BMD 5.1) upgrade provides EPAA Phase III integrated Air and Aegis BMD mission capability. The Aegis BL 9.C2 (BMD 5.1) TI-12H Backfit Procurement upgrade consists of hardware necessary to upgrade existing in-service Aegis BL 9.C2 (BMD 5.1) TI-12 ships to a TI-16 compatible weapon system configuration.

Aegis BL 5.4 (BMD 4.1) merges the BMD 4.1 capability with the U. S. Navy (USN) Aegis Baseline 5.3 into a single integrated computer program. Certification shift from FY 2019 to FY 2020.

The Aegis BL 5.4 (BMD 4.2) AN/SPY-1 upgrade with the U.S. Navy will provide refurbishment of existing ship AN/SPY-1 radar arrays with the installation of antenna Low Noise Amplifiers (LNAs). BMD 4.2 procures an Array Set in FY 2020 to support rotatable pool for radar refurbishment.

All Shipset procurements and installs are in alignment with Navy Ship Fielding Plan as of MAR 2018.

^(†) indicates the presence of a P-5a

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
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Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty <i>(Each)</i>	Unit Cost <i>(\$ M)</i>	Specs Avail Now?	Date Revision Available	RFP Issue Date
Aegis BL 5.4 (BMD 4.1) Installs ^(†)		2019	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Apr 2019	Sep 2019	3	0.150	Y		Jun 2018
Aegis BL 5.4 (BMD 4.1) Installs ^(†)		2020	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington DC	Apr 2020	Sep 2020	5	0.160	Y		Jun 2019
Aegis BL 5.4 (BMD4.1) Procurement ^(†)		2019	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Apr 2019	Mar 2020	10	0.100	Y		Jan 2018
Aegis BL 5.4 (BMD4.1) Procurement ^(†)		2020	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Apr 2020	Sep 2020	8	0.200	Y		Jan 2019
Aegis BL 9.C2 (BMD 5.1) BackFit Installs ^(†)		2017	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Oct 2017	Oct 2018	3	1.134	Y		Aug 2016
Aegis BL 9.C2 (BMD 5.1) BackFit Installs ^(†)		2018	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Oct 2017	Jun 2018	8	0.710	Y		Aug 2016
Aegis BL 9.C2 (BMD 5.1) BackFit Installs ^(†)		2019	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Jun 2019	Apr 2020	3	1.485	Y		Jun 2018
Aegis BL 9.C2 (BMD 5.1) BackFit Installs ^(†)		2020	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Feb 2020	Jun 2020	2	1.485	Y		Jun 2019
Aegis BL 9.C2 (BMD 5.1) BackFit Procurement ^(†)		2016	Lockheed Martin / Moorestown, N.J.	SS / FP	Dahlgren, VA	Nov 2015	Jan 2016	11	0.000	N		Sep 2015
Aegis BL 9.C2 (BMD 5.1) BackFit Procurement ^(†)		2017	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Feb 2017	Aug 2018	6	2.533	Y		Jul 2016
Aegis BL 9.C2 (BMD 5.1) Inline Installs ^(†)		2017	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Feb 2017	Aug 2018	1	3.310	Y		Jul 2016
Aegis BL 9.C2 (BMD 5.1) Inline Installs ^(†)		2018	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Jan 2018	Jan 2019	3	0.450	Y		Jul 2017
Aegis BL 9.C2 (BMD 5.1) Inline Installs ^(†)		2019	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Jan 2019	Jan 2020	1	0.450	Y		Jul 2018
Aegis BL 9.C2 (BMD 5.1) Inline Procurements ^(†)		2016	Lockheed Martin / Moorestown, N.J.	SS / FP	Dahlgren, VA	Jan 2016	Jan 2016	2	0.000	N		Sep 2015
Aegis BL 9.C2 (BMD 5.1) Inline Procurements		2017	Raytheon / Norfolk, VA	SS / FFP	Washington, D.C.	May 2017	Nov 2018	0	0.600	Y		Jul 2016
Aegis BL 9.C2 (BMD 5.1) Inline Procurements ^(†)		2017	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	May 2017	Nov 2018	1	3.913	Y		Jul 2016
Aegis BL 9.C2 (BMD 5.1) Inline Procurements ^(†)		2018	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Feb 2018	Apr 2019	3	3.735	Y		Jul 2017
Aegis BL 9.C2 (BMD 5.1) Inline Procurements ^(†)		2019	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Feb 2019	Aug 2020	3	3.360	Y		Jun 2018

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Exhibit P-5a, Procurement History and Planning: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
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Cost Elements	O C O	FY	Contractor and Location	Method/Type or Funding Vehicle	Location of PCO	Award Date	Date of First Delivery	Qty (Each)	Unit Cost (\$ M)	Specs Avail Now?	Date Revision Available	RFP Issue Date
Aegis BMD 3.6 to 4.X Hardware Procurements ^(†)		2016	Lockheed Martin / Moorestown, N.J.	SS / FP	Dahlgren, VA	Jan 2016	Jan 2016	6	0.000	N		Sep 2015
Aegis BMD 3.6 to 4.X Hardware Procurements		2017	Raytheon / Norfolk, VA	SS / FFP	Washington, D.C.	Feb 2017	Aug 2018	0	0.980	Y		Jul 2016
Aegis BMD 3.6 to 4.X Hardware Procurements ^(†)		2017	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Feb 2017	Aug 2018	1	12.100	Y		Jul 2016
Aegis BMD 3.6 to 4.X Hardware Procurements		2018	Raytheon / Norfolk, VA	SS / FFP	Washington, D.C.	Feb 2018	Aug 2019	0	0.980	Y		Jul 2017
Aegis BMD 3.6 to 4.X Hardware Procurements ^(†)		2018	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Feb 2018	Aug 2019	3	12.100	Y		Jul 2017
Aegis BMD 3.6 to 4.X Hardware Procurements ^(†)		2019	Lockheed Martin / Moorestown, N.J.	SS / FPIF	Washington, D.C.	Feb 2019	Aug 2020	1	11.000	Y		Jun 2018
Aegis BMD 3.6 to 4.X Installs ^(†)		2016	Lockheed Martin / Moorestown, N.J.	SS / FP	Dahlgren, VA	Jan 2016	Jan 2016	1	0.000	N		Sep 2015
Aegis BMD 3.6 to 4.X Installs ^(†)		2017	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Jan 2017	Jun 2018	1	9.100	Y		May 2016
Aegis BMD 3.6 to 4.X Installs ^(†)		2018	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Feb 2018	Feb 2019	5	7.100	Y		Aug 2016
Aegis BMD 3.6 to 4.X Installs ^(†)		2019	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Nov 2017	Sep 2019	3	7.300	Y		Nov 2017
Aegis BL 9.B/C2 (BMD 5.1) Software Upgrade Installs ^(†)		2019	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Apr 2019	Sep 2019	4	0.150	Y		Apr 2018
Aegis BL 9.B/C2 (BMD 5.1) Software Upgrade Installs ^(†)		2020	Lockheed Martin / Moorestown, N.J.	SS / CPIF	Dahlgren, VA	Apr 2020	Sep 2020	8	0.160	Y		Apr 2019

^(†) indicates the presence of a P-21

Remarks:

An Aegis BMD 3.6 to 4.x hardware procurement consists of two contracts: one SS/FPIF with Lockheed Martin, Moorestown NJ and one SS/FFP with Raytheon, Norfolk VA.

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2016														Fiscal Year 2017														BALANCE	
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2015	BAL DUE AS OF 1 OCT	Calendar Year 2016														Calendar Year 2017														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Aegis BL 5.4 (BMD 4.1) Installs																																			
	1	2019	MDA	3	0	3																							3						
	1	2020	MDA	5	0	5																							5						
Aegis BL 5.4 (BMD4.1) Procurement																																			
	2	2019	MDA	10	0	10																							10						
	3	2020	MDA	8	0	8																							8						
Aegis BL 9.C2 (BMD 5.1) BackFit Installs																																			
	4	2017	MDA	3	0	3																							3						
	4	2018	MDA	8	0	8																							8						
	4	2019	MDA	3	0	3																							3						
	4	2020	MDA	2	0	2																							2						
Aegis BL 9.C2 (BMD 5.1) BackFit Procurement																																			
	5	2016	MDA	11	0	11																							0						
	6	2017	MDA	6	0	6																							6						
Aegis BL 9.C2 (BMD 5.1) Inline Installs																																			
	7	2017	MDA	1	0	1																							1						
	7	2018	MDA	3	0	3																							3						
	7	2019	MDA	1	0	1																							1						
Aegis BL 9.C2 (BMD 5.1) Inline Procurements																																			
	8	2016	MDA	2	0	2																							0						
	9	2017	MDA	1	0	1																							1						
	9	2018	MDA	3	0	3																							3						
	9	2019	MDA	3	0	3																							3						
Aegis BMD 3.6 to 4.X Hardware Procurements																																			
	10	2016	MDA	6	0	6																							0						
	11	2017	MDA	1	0	1																							1						
	11	2018	MDA	3	0	3																							3						
	11	2019	MDA	1	0	1																							1						
Aegis BMD 3.6 to 4.X Installs																																			
	12	2016	MDA	1	0	1																							0						
	12	2017	MDA	1	0	1																							1						
	12	2018	MDA	5	0	5																							5						
	12	2019	MDA	3	0	3																							3						
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2016												Fiscal Year 2017												BALANCE	
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2015	BAL DUE AS OF 1 OCT	Calendar Year 2016												Calendar Year 2017												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
Aegis BL 9.B/C2 (BMD 5.1) Software Upgrade Installs																															
	13	2019	MDA	4	0	4																							4		
	14	2020	MDA	8	0	8																							8		
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2018												Fiscal Year 2019												BALANCE						
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2017	BAL DUE AS OF 1 OCT	Calendar Year 2018												Calendar Year 2019																	
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P					
Aegis BL 9.B/C2 (BMD 5.1) Software Upgrade Installs																																				
	13	2019	MDA	4	0	4																							A -	-	-	-	-	-	4	0
	14	2020	MDA	8	0	8																														8
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P						

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2020														Fiscal Year 2021														BALANCE	
O C C O	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2019	BAL DUE AS OF 1 OCT	Calendar Year 2020														Calendar Year 2021														
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					
Aegis BL 5.4 (BMD 4.1) Installs																																			
	1	2019	MDA	3	3	0																							0						
	1	2020	MDA	5	0	5																							0						
Aegis BL 5.4 (BMD4.1) Procurement																																			
	2	2019	MDA	10	0	10	-	-	-	-	-	10																	0						
	3	2020	MDA	8	0	8																							0						
Aegis BL 9.C2 (BMD 5.1) BackFit Installs																																			
	4	2017	MDA	3	3	0																							0						
	4	2018	MDA	8	8	0																							0						
	4	2019	MDA	3	0	3	-	-	-	-	-	3																	0						
	4	2020	MDA	2	0	2																							0						
Aegis BL 9.C2 (BMD 5.1) BackFit Procurement																																			
	5	2016	MDA	11	11	0																							0						
	6	2017	MDA	6	6	0																							0						
Aegis BL 9.C2 (BMD 5.1) Inline Installs																																			
	7	2017	MDA	1	1	0																							0						
	7	2018	MDA	3	3	0																							0						
	7	2019	MDA	1	0	1	-	-	-	1																			0						
Aegis BL 9.C2 (BMD 5.1) Inline Procurements																																			
	8	2016	MDA	2	2	0																							0						
	9	2017	MDA	1	1	0																							0						
	9	2018	MDA	3	1	2	-	-	-	1	-	-	1																0						
	9	2019	MDA	3	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0						
Aegis BMD 3.6 to 4.X Hardware Procurements																																			
	10	2016	MDA	6	6	0																							0						
	11	2017	MDA	1	1	0																							0						
	11	2018	MDA	3	1	2	-	1																					1						
	11	2019	MDA	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0						
Aegis BMD 3.6 to 4.X Installs																																			
	12	2016	MDA	1	1	0																							0						
	12	2017	MDA	1	1	0																							0						
	12	2018	MDA	5	4	1	-	1																					0						
	12	2019	MDA	3	3	0																							0						
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P					

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
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Cost Elements <i>(Units in Each)</i>						Fiscal Year 2020												Fiscal Year 2021												BALANCE	
O C C #	M F R #	FY	SERVICE	PROC QTY	ACCEPT PRIOR TO 1 OCT 2019	BAL DUE AS OF 1 OCT	Calendar Year 2020												Calendar Year 2021												
							O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G		S E P
Aegis BL 9.B/C2 (BMD 5.1) Software Upgrade Installs																															
	13	2019	MDA	4	4	0																							0		
	14	2020	MDA	8	0	8																							0		

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Exhibit P-21, Production Schedule: PB 2020 Missile Defense Agency **Date:** March 2019

Appropriation / Budget Activity / Budget Sub Activity: 0300D / 01 / 17	P-1 Line Item Number / Title: MD90 / Aegis BMD Hardware and Software	Item Number / Title [DODIC]: Aegis BMD Shipsets
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MFR Ref #	Manufacturer Name - Location	Production Rates (Each / Month)			Procurement Leadtime (Months)								
		MSR For 2020	1-8-5 For 2020	MAX For 2020	Initial				Reorder				
					ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1	ALT Prior to Oct 1	ALT After Oct 1	Manufacturing PLT	Total After Oct 1	
1	Lockheed Martin - Moorestown, N.J.	1	1	6	0	0	0	0	0	0	0	0	0
2	Lockheed Martin - Moorestown, N.J.	1	1	10	0	0	0	0	0	0	0	0	0
3	Lockheed Martin - Moorestown, N.J.	1	1	8	0	0	0	0	0	0	0	0	0
4	Lockheed Martin - Moorestown, N.J.	1	1	4	0	0	0	0	0	0	0	0	0
5	Lockheed Martin - Moorestown, N.J.	1	1	11	0	0	0	0	0	0	0	0	0
6	Lockheed Martin - Moorestown, N.J.	1	1	2	0	0	0	0	0	0	0	0	0
7	Lockheed Martin - Moorestown, N.J.	1	1	1	0	0	0	0	0	0	0	0	0
8	Lockheed Martin - Moorestown, N.J.	1	1	2	0	0	0	0	0	0	0	0	0
9	Lockheed Martin - Moorestown, N.J.	1	1	1	0	0	0	0	0	0	0	0	0
10	Lockheed Martin - Moorestown, N.J.	1	1	6	0	0	0	0	0	0	0	0	0
11	Lockheed Martin - Moorestown, N.J.	1	1	1	0	0	0	0	0	0	0	0	0
12	Lockheed Martin - Moorestown, N.J.	1	1	3	0	0	0	0	0	0	0	0	0
13	Lockheed Martin - Moorestown, N.J.	1	1	4	0	0	0	0	0	0	0	0	0
14	Lockheed Martin - Moorestown, N.J.	1	1	8	0	0	0	0	0	0	0	0	0

Remarks:
An Aegis BMD 3.6 to 4.x hardware procurement consists of two contracts: one SS/FFIF with Lockheed Martin, Moorestown NJ and one SS/FFP with Raytheon, Norfolk VA.

"A" in the Delivery Schedule indicates the Contract Award Date.
Note: Due to space limitations, quantities in the Exhibit P-21 delivery calendar are truncated and rounded based on the maximum quantity in the calendar as follows. If the maximum quantity is less than or equal to than 9,999, all quantities are shown as each. If the maximum quantity is between 10,000 and 999,999 all quantities are shown in thousands. If the maximum quantity is between 1,000,000 and 999,999,999 all quantities are shown in millions (rounded to the nearest thousand). If the maximum quantity is equal or greater than 1,000,000,000 all quantities are shown in billions (rounded to the nearest million).

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