Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification					ate Iay 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) R-1 NOMENCLATURE 0603907C Sea Based X				Radar (SBX)				
COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Total Program Element (PE) Cost	155,244	146,895	174,576					
XX46 Sea Based X-Band Radar (SBX) Sustainment	155,244	146,895	174,576					

Note: The President's Budget submit for FY09 captured SBX funding for FY09 and out in the BMD Sensors program element. This budget submit carries all SBX funding in the Sea-based X-Band Radar program element (PE 0603907C).

For all Ballistic Missile Defense (BMD) System Level Test Schedule information, please refer to the Ballistic Missile Defense (BMD) System Level Test Schedule tab.

BMD Systems Engineering provides System Description Documents and System Specifications for elements to design, build, integrate and test BMDS components. These products optimize performance at the system level and further ensure that the assessment of the designed BMD System is based on sufficient ground and flight testing. Compliance of Sensors to BMD System level requirements is monitored in a series of requirements and design reviews both at the system and element levels.

The best way to dissuade, deter, and defeat ballistic missile threats is through integrated ballistic missile defense capabilities -- weapons, sensors, and command and control, battle management and communications (C2BMC). A potential or actual attack may cross regions and may fly higher and faster than stand-alone, autonomous capabilities operated by a single Military Service can defend against. Integrated BMD capabilities draw on space-, land-, and sea-based assets operated by multiple Services to provide both the best sensor information on the enemy missile's location and track as well as a more diverse and effective set of weapon options for the Combatant Commander to defeat the attack -- all connected by a unifying C2BMC system. As a result, an effort funded in a Program Element may be critical to success of efforts in other Program Elements -- we refer to these connections as ``interdependencies." Throughout the budget justification material, we have attempted to highlight interdependencies in order to explain fully the relationship between different parts of the proposed program.

Modeling and simulation (M&S) activities support all phases of Sensors development, including development of modifications to the SBX, flight test missions, ground tests, wargames, exercises, and performance assessment. Models and simulations are tailored to the specific need of a component in its current phase of development, ranging from low-to-medium fidelity analyses supporting concept definition studies, to high-fidelity models used to support engineering development, or testing and are integrated into the BMD Digital Simulations Architecture. Digital simulations support Program Assessment events, which provide critical system level performance data relative to all elements, the system engineer, M&S developers, OTA and Warfighter. Further, the M&S Digital tools are accredited for each application and for specific objectives; tools are put through a rigorous verification and validation process, reviewing coding and specifications, and comparing analyses against actual flight test results.

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

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Planning support is required to assist in the V&V plan development, test execution, analysis for V&V reports and program office M&S certification. The Digital End-to-End simulation of the BMDS requires a PA Integrated V&V Plan and Report (at both element and system level), and a PA-system level Accreditation Plan and Report.

Sensors will support the BMDS HWIL Modeling and Simulation Program by providing and integrating into the BMDS system-level HWIL single stimulation framework to support full-envelope BMDS ground test, flight test, and training events based upon Agency and warfighter needs.

MDA Element testing is based on an integrated, comprehensive, and phased test program. Element systems, subsystems, and components are tested early in development and are necessary prior to conducting BMD-System level testing. Sensors SBX Element Level testing is funded as part of a developmental program and reflected in this Program Element (PE) submission. This PE also provides SBX participation in the consolidated MDA-wide System Test Program and the resources for the, planning, design, execution, and management of SBX in BMD System testing in accordance with the BMDS Test Policy, MDA Directive 3202.03 (Jan 09). This applies to all Flight, Integrated Ground, and Distributed Ground Tests and Post-test analysis and reconstructions listed in the Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

A.1 System Element Description

This project provides for the operations and support of the Sea-Based X-Band (SBX) Radar and its four major sub-systems: the self-propelled vessel; the X-Band Radar (XBR); the In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT); and the communications network.

A.2 System Element Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS)

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The SBX is the largest X-Band radar in the world and serves as the primary midcourse sensor in the BMDS layered network of radars. Self-propelled and semi-submersible, the SBX operates in various locations in the Pacific Ocean. It enables Combatant Commanders to engage ballistic missile threats in all phases of flight. The SBX provides high resolution cued search, acquisition, tracking, target discrimination, and debris assessments. The Ground-Based Midcourse system (PE 0603882C) relies on SBX radar data for fire control solutions. Operations and sustainment of satellite communications to the BMDS are provided by C2BMC, and enable sensor tasking/control by the Ground-Based Midcourse fire control (GFC).

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

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A.3 Major System Element Goals

The major goals of this system element are to:

- Operate and sustain the SBX and its subsystems to support BMDS flight testing and operations as required;
- Deliver advanced XBR algorithms to address evolving threats;
- Continue to enhance SBX capabilities and integrate into the BMDS;
- Participate in BMDS ground and flight tests and Targets of Opportunity testing (funding for testing is carried under PE 0603884C (Test and Evaluation line));
- Achieve American Bureau of Shipping (ABS) certification;
- Support the decision to transfer the SBX to the U.S. Navy;
- Enhance XBR portion of GMDSIM to provide high fidelity digital simulation;

A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	
Flight Test			
Flight Tests			
Operation Burnt Frost	XX46	2Q FY 2008	
FTG-06	XX46	2Q FY 2009	
Targets of Opportunity Participation			
Glory Trip - 196	XX46	2Q FY 2008	
Glory Trip -197	XX46	2Q FY 2008	
Glory Trip -194	XX46	4Q FY 2008	
Glory Trip -198	XX46	1Q FY 2009	
Glory Trip -195	XX46	3Q FY 2009	
Glory Trip -199	XX46	4Q FY 2009	
Glory Trip -200	XX46	1Q FY 2010	
Ground Test			
GTI-04	XX46	2Q FY 2010	
GTD-04	XX46	4Q FY 2010	
GTX-05B	XX46	4Q FY 2010	
Contract Activity	·		
SBX			

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Major Event	Project	Timefr	ame
Shipyard Period & Sea Trials	XX46	2Q FY	2009 - 3Q FY 2009
Software Builds			
XBR Software Delivery B2.2.1.2	XX46	2Q FY	2009
Other			
Early Capability Declaration (ECD)	XX46	4Q FY	2008
Partial Capability Declaration (ECD)	XX46	4Q FY	2009
Complete Full Qualification Testing (FQT) Build 3	XX46	2Q FY	2010
Performance Assessment (PA-09)	XX46	1Q FY	2010
Performance Assessment (PA-10)	XX46	4Q FY	2010

B. Program Change Summary Table	FY 2008	FY 2009	FY 2010	FY 2011
Previous President's Budget (FY2009 PB)	165,243	0	0	
Current President's Budget (FY2010 PB)	155,244	146,895	174,576	
Total Adjustments	-9,999	146,895	0	
Congressional Program Reductions	0	0	0	
Congressional Rescissions	0	0	0	
Total Congressional Increases	0	146,895	0	
Total Reprogrammings	-9,999	0	0	
SBIR/STTR Transfer	0	0	0	
Adjustments to Budget Years	0	0	174,576	

FY08 decrease of \$9.999 million includes SBIR/STTR transfer and MDA adjustments.

Increases in FY09-10 are the result of Congressionally-directed transfers of SBX funding from the BMD Sensors program element to this PE.

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Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

				D	ate			
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification				lay 2009				
APPROPRIATION/BUDGET ACTIVITY R-1 NOMENCLATU			URE					
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)			7C Sea Base	d X-Band F	adar (SBX)			
COST (\$ in Thousands)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
XX46 Sea Based X-Band Radar (SBX) Sustainment	155,244	146,895	174,576					
RDT&E Articles Qty	0	0	0					
	•						•	

Accomplishments/Planned Program

1100011101110110071110011100				
	FY 2008	FY 2009	FY 2010	FY 2011
Sea-Based X-Band Radar Development	28,908	19,406	14,350	

FY08 Accomplishments:

- Conducted Navy Material Readiness Evaluation and achieved Early Capability Declaration
- Participated in DoD Special Missions (Burnt Frost, Fast Shield I)
- Installed XBR software build 2.2 aboard SBX-1 for early integration testing
- Implemented closed loop advanced algorithm discrimination process
- Continued Discrimination and Algorithm development

FY09 Planned Program:

- Continue software development and maintenance, with focus on advanced discrimination and algorithms
- Continue XBR software build 2.2 integration and testing
- Begin development of XBR software build 3.0
- Participate in Glory Trips 195/198/199 and FTG-06
- Continue maturation of SBX advanced algorithms
- Complete modifications to Liquid Conditioning and Cooling System (LCCS)

FY10 Planned Program:

- Continue development, integration, testing, and maintenance of XBR software, including Build 3.0
- Complete Full Qualification Testing (FQT) for Build 3

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RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603907C Sea Based X-Ban	d Radar (SBX)

- Participate in Performance Assessments (PA-09 and PA-10)
- Verify and validate SBX analytical model
- Participate in Ground Testing (GTI-04, GTD-04, and GTX-05B)
- Continue maturation of SBX advanced algorithms
- Complete GMD simulation (GMDSIM) required enhancements in support of performance assessment (PA-10)

	FY 2008	FY 2009	FY 2010	FY 2011
SBX System Integration	5,826	3,100	3,600	

These activities include the X-Band radar integration with the SBX platform and the continued integration of the SBX weapon system into the BMDS. Efforts include system engineering in support of BMDS flight and ground testing. Additionally, MDA will continue to prepare for the transfer of SBX to the U.S. Navy.

FY08 Accomplishments:

- Conducted Navy Material Readiness Evaluation and received Early Capability Declaration
- Participated in OPERATION "Burnt Frost"
- Participated in BMDS Ground and Flight tests

FY09 Planned Program:

- Support BMDS system ground and flight tests (Glory Trips 195/198/199 and FTG-06)
- Support Transition and Transfer of SBX to US Navy
- Support advanced algorithm maturation for X-Band radars
- Achieve Partial Capability Declaration (PCD)
- Support shipyard activities

FY10 Planned Program:

- Support BMDS system ground (GTI-04, GTD-04, and GTX-05B) and flight tests
- Support Transition and Transfer of SBX to US Navy

		Date
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RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603907C Sea Based X-Ban	d Radar (SBX)

- Support development of advanced XBR algorithms to address evolving threats.
- •

	FY 2008	FY 2009	FY 2010	FY 2011
System Force Protection	4,300	6,400	6,600	

Force protection for the SBX is an ongoing effort comprising two major functions: on-board protection of the vessel, and portside security for the SBX vessel and its Off-Shore Support (OSS) vessel while docked. On-board protection security functions include: on-board visitor control, access control to sensitive areas, inspection of incoming personnel and equipment, and protection against hostile boarding. Portside security functions include: inspection and control of all supplies and equipment being readied for transport onto the SBX, access control of the docking area, and visitor control to the SBX and support vessel.

FY08 Accomplishments:

• Provided on-board force protection for the SBX and portside security for the SBX and its off-shore support vessel.

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FY09 Planned Program:

• Continue to provide on-board force protection for the SBX and portside security for the SBX and its off-shore support vessel.

FY10 Planned Program:

- Continue to provide on-board force protection for the SBX and portside security for the SBX and its off-shore support vessel
- When SBX deploys to Adak, provide additional pier-side security
- When SBX deploys to Adak, provide patrol boat security

	FY 2008	FY 2009	FY 2010	FY 2011
SBX Vessel Operations and Support	85,456	88,059	106,426	

This funding covers the ongoing operations and sustainment of the SBX platform, its support vessel (the motor vessel Dove), and land-based support facilities. These activities include fueling, provisioning, and staffing of the SBX platform and support vessel, care and lodging of crews, and

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		Date
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APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603907C Sea Based X-Ban	d Radar (SBX)

transportation of crews and equipment. Funding also provides for operations and maintenance of logistical support facilities at Adak and Anchorage, Alaska.

FY08 Accomplishments:

- Operated and maintained the SBX, its support vessel, and logistics support facilities.
- Procured and maintained long lead repair/replacement parts in preparation for vessel enhancements and certification shipyard period
- Provide SBX and motor vessel Dove crews, provisioning, spares, and motor vessel Dove lease

FY09 Planned Program:

- Provide SBX and motor vessel Dove crews, provisioning, spares, and motor vessel Dove lease
- Continue ongoing operations, maintenance, and logistical support of the SBX and the motor vessel Dove
- Complete shipyard activities to include:
 - Galley upgrades
 - Starboard crane upgrade
 - Port crane installation
 - Fast-rescue boat installation
- Operational Control Center (OCC) enhancements

FY10 Planned Program:

- Provide SBX and motor vessel Dove crews, provisioning, spares, and motor vessel Dove lease
- Continue ongoing operations, maintenance, and logistical support of the SBX and the motor vessel Dove
- Participate in BMDS ground and flight tests to include Targets of Opportunity (TOO)
- Acquire generators and associated hardware and supply items in preparation for shipyard period beginning 4th Qtr FY10
- Initiate hardware and software obsolescence planning for potential replacement of processors, controls, and displays.

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E	ication		Date May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes	R-1 NO	MENCLATURE 7C Sea Based X-Band	•		
	FY 2008		FY 2009	FY 2010	FY 2011
XBR Operations and Support	30,754		29,930	41,800	

Operations and sustainment of the SBX's X-Band radar include: manpower for operating and maintaining the radar, spare and repair parts procurement, and hardware maintenance. The on-vessel XBR personnel perform the functions of 24/7 radar operations, calibration of the radar and support/test equipment, and maintenance and repair of the radar associated equipment.

FY08 Accomplishments:

• Operated and maintained the SBX's X-Band radar and associated equipment.

FY09 Planned Program:

- Continue to operate and maintain the X-Band radar and associated equipment.
- Conduct shipyard period.

FY10 Planned Program:

- Continue to operate and maintain the X-Band radar and associated equipment
 - Maintain mission hardware
 - Provide and support operations crew
 - Provide Missile Defense Integrated Operations Center (MDIOC) support
 - Fund XBR subcontractors and vendors
- Replace obsolete XBR superdomes and workstations

	FY 2008	FY 2009	FY 2010	FY 2011
SBX Communications Operations and Sustainment	0	0	1,800	

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justif	ication	Date May 2009							
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603907C Sea Based X-Bar	nd Radar (SBX)							
This Operations and Support (O&S) effort supports the Sea-Based X-Band rada operational spares, repair, and replacement; communications operators / maintai operations.									
FY10 Planned Program:									
 Continue 24/7/365 sustainment for Communications capabilities associated Continue on-site C2BMC support of fielded sites for hardware and software Continue C2BMC operator training for fielded capabilities Continue sustaining engineering support and integrated logistics support for 		tware							

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C .	Other	Program	Funding	Summary

FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Total Cost
106.437			112011	112012	7.7.2010	112011	1 1 2010	-
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503,475	400,751	186,697						-
574,231	777,693	636,856						-
330,874	385,493	0						-
619,137	919,956	966,752						-
416,937	402,778	369,145						-
193,157	175,712	301,566						-
1,126,337	1,113,655	1,690,758						-
226,499	208,923	180,000						-
223,084	283,481	0						-
16,237	24,686	12,549						-
439,997	288,287	340,014						-
51,387	55,764	48,186						-
45,400	69,743	60,921						-
77,102	106,040	86,949						-
1,945	2,968	6,164						-
0	362,007	0						-
0	76,537	0						-
0	0	50,504						-
0	27,008	0						-
0	0	119,634						-
137,409	0	0						-
5,971	19,667	19,709						-
83,907	81,174	57,403						-
	1,034,478 2,198,664 503,475 574,231 330,874 619,137 416,937 193,157 1,126,337 226,499 223,084 16,237 439,997 51,387 45,400 77,102 1,945 0 0 0 137,409 5,971	106,437 119,308 1,034,478 956,686 2,198,664 1,507,481 503,475 400,751 574,231 777,693 330,874 385,493 619,137 919,956 416,937 402,778 193,157 175,712 1,126,337 1,113,655 226,499 208,923 223,084 283,481 16,237 24,686 439,997 288,287 51,387 55,764 45,400 69,743 77,102 106,040 1,945 2,968 0 362,007 0 76,537 0 0 27,008 0 0 0 137,409 0 5,971 19,667	106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 76,537 0 0 76,537 0 0 76,537 0 0 76,5	106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 76,537 0 0 27,008 0 0 0 50,504 0 0 <td>106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 76,537 0 0 0 50,504 0 27,008 0 0 0<td>106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 76,537 0 0 0 50,504 0 0 0 137,409 0 0 5,971 19,667 19,709</td><td>106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 0 50,504 0 0 0 0 0 0 19,634 137,409 0 0 0 0 5,971<</td><td>106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 76,537 0 0 0 50,504 0 0 0 0 0 0 0 0 0 5,971 19,667 19,709</td></td>	106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 76,537 0 0 0 50,504 0 27,008 0 0 0 <td>106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 76,537 0 0 0 50,504 0 0 0 137,409 0 0 5,971 19,667 19,709</td> <td>106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 0 50,504 0 0 0 0 0 0 19,634 137,409 0 0 0 0 5,971<</td> <td>106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 76,537 0 0 0 50,504 0 0 0 0 0 0 0 0 0 5,971 19,667 19,709</td>	106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 76,537 0 0 0 50,504 0 0 0 137,409 0 0 5,971 19,667 19,709	106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 362,007 0 0 0 50,504 0 0 0 0 0 0 19,634 137,409 0 0 0 0 5,971<	106,437 119,308 109,760 1,034,478 956,686 719,465 2,198,664 1,507,481 982,922 503,475 400,751 186,697 574,231 777,693 636,856 330,874 385,493 0 619,137 919,956 966,752 416,937 402,778 369,145 193,157 175,712 301,566 1,126,337 1,113,655 1,690,758 226,499 208,923 180,000 223,084 283,481 0 16,237 24,686 12,549 439,997 288,287 340,014 51,387 55,764 48,186 45,400 69,743 60,921 77,102 106,040 86,949 1,945 2,968 6,164 0 76,537 0 0 0 50,504 0 0 0 0 0 0 0 0 0 5,971 19,667 19,709

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

UNCLASSIFIED									
Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justif	ication	Date May 2009							
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE 0603907C Sea Based X-Ban	nd Radar (SBX)							
D. Acquisition Strategy									
The SBX will continue to follow the Missile Defense Agency's capability-based evolutionary acquisition through the use of MDA's new block structure and incr		emphasizes testing, development and							
evolutionary acquisition through the use of MDA's new block structure and incr	ementai development.								

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

		Date
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost An	nalysis	May 2009
APPROPRIATION/BUDGET ACTIVITY	R-1 NOMENCLATURE	
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	0603907C Sea Based X-Ban	d Radar (SBX)

I. Product Development Cost (\$ in Thousands)

1. I Toutet Development Cost (ф пп тпоць	aliab)								
					FY 2009		FY 2010		FY 2011	
	Contract	Performing	Total		Award/		Award/		Award/	
	Method	Activity &	PYs	FY 2009	Oblg	FY 2010	Oblg	FY 2011	Oblg	Total
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost
Sea-Based X-Band Radar Development										
		Boeing/								
SBX and XBR Development	SS/CPAF	AL/AK/AZ/CA/CO/HI/MA/TX/VA	28,908	19,406	4Q	14,350	1/2Q			62,664
SBX System Integration										
		Boeing/								
SBX Systems Integration	SS/CPAF	AL/AK/AZ/CA/CO/HI/MA/TX/VA	5,826	3,100	1Q	3,600	1/2Q			12,526
Subtotal Product Development			34,734	22,506		17,950				75,190

Remarks

II. Support Costs Cost (\$ in Thousands)

				FY 2009		FY 2010		FY 2011	
Contract	Performing	Total	FY	Award/	FY	Award/	FY	Award/	
Method	Activity &	PYs	2009	Oblg	2010	Oblg	2011	Oblg	Total
& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost
	ALUTIIA/								
SS/CPFF	AK/VA	4,300	6,400	N/A	6,600	1Q			17,300
	Boeing/TBD/								
SS/CPAF	AL/AK/AZ/CA/CO/HI/MA/TX/VA	57,456	42,894	1/2Q	41,100	1/2Q			141,450
	Boeing/TBD/								
SS/Various	AL/AK/AZ/CA/CO/HI/MA/TX/VA	0	14,165	1/2Q	8,926	1/2Q			23,091
	Boeing/TBD/								
SS/CPAF	AL/AK/AZ/CA/CO/HI/MA/TX/VA	28,000	31,000	1/2Q	32,000	1/2Q			91,000
	TBD/								
SS/Various	AL/AK	0	0	4Q	3,400	1/2Q			3,400
	Method & Type SS/CPFF SS/CPAF SS/Various	Method & Activity & Location ALUTIIA/ SS/CPFF AK/VA Boeing/TBD/ SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA Boeing/TBD/ SS/Various AL/AK/AZ/CA/CO/HI/MA/TX/VA Boeing/TBD/ SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA TBD/	Method & Type Activity & Location PYs Cost ALUTIIA/ SS/CPFF ALVTIIA/ AK/VA 4,300 Boeing/TBD/ SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA 57,456 Boeing/TBD/ SS/Various AL/AK/AZ/CA/CO/HI/MA/TX/VA 0 Boeing/TBD/ SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA 28,000 TBD/ TBD/	Method & Type Activity & Location PYs Cost 2009 Cost ALUTIIA/ AK/VA 4,300 6,400 Boeing/TBD/ SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA 57,456 42,894 Boeing/TBD/ SS/Various AL/AK/AZ/CA/CO/HI/MA/TX/VA 0 14,165 Boeing/TBD/ SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA 28,000 31,000 TBD/ TBD/ 31,000 31,000	Contract Method Performing Activity & PYs Total PYs Award/ Oblg Date & Type Location Cost Cost Date ALUTIIA/ AK/VA 4,300 6,400 N/A Boeing/TBD/ SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA 57,456 42,894 1/2Q Boeing/TBD/ SS/Various AL/AK/AZ/CA/CO/HI/MA/TX/VA 0 14,165 1/2Q SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA 28,000 31,000 1/2Q TBD/ TBD/ TBD/ TBD/ TDD TDD	Contract	Contract Performing Total FY Award/ FY Award/ Method Activity & PYs 2009 Oblg 2010 Oblg & Type Location Cost Cost Date Cost Date ALUTIIA/ SS/CPFF AK/VA 4,300 6,400 N/A 6,600 1Q Boeing/TBD/ SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA 57,456 42,894 1/2Q 41,100 1/2Q Boeing/TBD/ SS/Various AL/AK/AZ/CA/CO/HI/MA/TX/VA 0 14,165 1/2Q 8,926 1/2Q SS/CPAF AL/AK/AZ/CA/CO/HI/MA/TX/VA 28,000 31,000 1/2Q 32,000 1/2Q TBD/ TBD/ <t< td=""><td> Contract</td><td> Contract</td></t<>	Contract	Contract

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

MDA Exhibit R-3 (PE 0603907C)

		nibit R-3 RDT&E Project Cost	Analysis			May 20	09			
APPROPRIATION/BUDGET ACTIVIT				MENCLA	TURE					
RDT&E, DW/04 Advanced Compo	onent Developmer	nt and Prototypes (ACD&P)	060390	7C Sea Ba	sed X-Ban	d Radar (SBX)			
					FY 2009		FY 2010		FY 2011	
	Contract	Performing	Total	FY	Award/	FY	Award/	FY	Award/	
	Method	Activity &	PYs	2009	Oblg	2010	Oblg	2011	Oblg	Total
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost
		TBD/								
Vessel Voyage Repairs	SS/Various	AL/AK/HI	0	0	N/A	13,000	1/2Q			13,000
		US Navy/								
Navy Hybrid Program Office	SS/MIPR	AL/AK/HI	0	0	4Q	8,000	1Q			8,000
XBR Operations and Support										
		Raytheon/								
XBR Operations and Support	SS/CPIF	AL/AK/HI	30,754	29,930	N/A	31,200	N/A			91,884
		Raytheon/								
Replace XBR Superdomes	SS/CPIF	AL/AK/HI	0	0	N/A	10,600	1Q			10,600
SBX Communications Operations and Sustainment										
		DISA/								
SBX Comms O&S	MIPR	VA	0	0	N/A	1,800	1Q			1,800
Subtotal Support Costs			120,510	124,389		156,626				401,525
Remarks	1			l .						
III. Test and Evaluation Cost (\$ in Thousands									
			FY 2009		FY 2	2010		FY 20	11	

Award/

Oblg

Date

Award/

Oblg

Date

FY 2011

Cost

FY 2010

Cost

Remarks

Cost Categories:

Subtotal Test and Evaluation

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

Contract

Method

& Type

Performing

Activity &

Location

Total

PYs

Cost

MDA Exhibit R-3 (PE 0603907C)

Total

Cost

Award/

Oblg

Date

FY 2009

Cost

Missile	Defense Age	ency (MDA) Exhil	bit R-3 RDT&	st Analysis		Date May	2009		·						
APPROPRIATION/BUDGET	-	ent Davalanmant	and Prototy		R-1 NOMENCLATURE 0603907C Sea Based X-Band Radar (SBX)										
IV. Management Services Cost (\$ in Thousands)															
					FY 2009		FY 2010		FY 2011						
	Contract	Performing	Total	1	Award/		Award/		Award/						
	Method	Activity &	PYs	FY 2009	Oblg	FY 2010	Oblg	FY 2011	Oblg	Total					
Cost Categories:	& Type	Location	Cost	Cost	Date	Cost	Date	Cost	Date	Cost					
Subtotal Management Services															
Remarks															
Project Total Cost			155,244	146,895		174,576				476,715					
Remarks															

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

MDA Exhibit R-3 (PE 0603907C)

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile														Date May 2009																			
APPROPRIATION/BUDGET ACTIVITY		_					ъ			,		D 0	D)			NON																	
RDT&E, DW/04 Advanced Compone	ent I	Jev	eloj	ome	nt a	nd	Pro	tot	ype	es (A	AC	D&	P)		603	907	C S	ea I	Bas	ed X	-Ba	nd]	Rad	ar (SBY	()			_				ī
Fiscal Year		20	08			2009			20	010			20	2011			2012			2013				2014				2	015				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	2 3	4	1	2	3	4	
Targets of Opportunity Participation													_								_								_				
Glory Trip-196		\Q																															
Glory Trip-197		\Q																															
Glory Trip-194				\Q																													
Glory Trip-198					\Diamond																												
Glory Trip-195							\Diamond																										
Glory Trip-199								\Diamond																									
Glory Trip-200				_					\Diamond																								
Flight Tests																																	
Operation Burnt Frost		Δ																										\perp					
FTG-06								Δ		L		L		L							L		L	\perp			\perp	L	L				
Ground Tests												, .		,													,	,				,	
GTI-04										Δ																		\perp					
GTD-04											Δ	ļ,																					
GTX-05B							\perp					Δ				L				\perp							\perp	┸		L		L	
Other										,		,			1	,				,		,			,	,	,	,		,	,	,	
Early Capability Declaration				Δ																													
Partial Capability Declaration								Δ																									
Performance Assessment (PA-09)									Δ			ļ.,																					
Performance Assessment (PA-10)												Δ																					

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

MDA Exhibit R-4 (PE 0603907C)

Line Item 92 - 16 *of* 18 **UNCLASSIFIED**

Missile Defense	Agenc	y (MDA	() Exhib	oit R-4	Schedul	e Profil	le							Dat Ma	e y 20	09										
APPROPRIATION/BUDGET ACTIVITY								R-1 NOMENCLATURE 0603907C Sea Based X-Band Radar (SBX)																		
RDT&E, DW/04 Advanced Component I	Develo	pment	and P	rototyp	es (AC	D&P)	(060390	7C S	Sea I	Basec	l X-l	Band	Ra	dar ((SB)	X)									
Fiscal Year	20	008	20	009	20	10		2011		2012				2	2013			20	014			201	5			
	1 2	3 4	1 2	3 4	1 2	3 4	1	2 3	4	1			4 1	2	_	4	1	2	_	4	1		3	4		
SBX																		<u> </u>								
Ship y ard Period & Sea Trials			Δ-										Т	Т	Т	Γ										
Software Builds								•								•		•								
XBR Software Delivery B2.2.1.2			Δ																							
Complete Full Qual Testing (FQT) B2.2.1.2				Δ																						
Complete Full Qual Testing (FQT)Build 3					Δ																					
					L	egend																				
	*		gnificant Event (complete) ilestone Decision (complete)					Significar Mileston	nt Eve e Deci	nt (pla ision (nned) planne	d)														
	\hat{\hat{\hat{\hat{\hat{\hat{\hat{	Element T	est (comp	lete)			>	> Element Test (planned) 7 System Level Test (planned)																		
		System Le Complete	evel Test (c Activity	complete)			7 _∆																			
													_		_											

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

MDA Exhibit R-4 (PE 0603907C)

Missile Defense Age	ency (MDA) Ex			Date May 2009											
APPROPRIATION/BUDGET ACTIVITY RDT&E, DW/04 Advanced Component Dev	velopment and	l Prototypes (A	ACD&P)	R-1 NOMENCLATURE 0603907C Sea Based X-Band Radar (SBX)											
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015							
Targets of Opportunity Participation															
GT-196	2Q														
GT-197	2Q														
GT-194	4Q														
GT-198		1Q													
GT-195		3Q													
GT-199		4Q													
GT-200			1Q												
Flight Tests															
Operation Burnt Frost	2Q														
FTG-06		4Q													
Ground Tests															
GTI-04			2Q												
GTD-04			3Q												
GTX-05B			4Q												
SBX															
Shipyard Period & Sea Trials		2Q-3Q													
Software Builds															
XBR Software Delivery B2.2.1.2		2Q													
Complete Full Qualification Testing (FQT) Build 2.2.1.2		3Q													
Complete Full Qualification Testing (FQT) Build 3			2Q												
Other															
Early Capability Declaration (ECD)	4Q														
Partial Capability Declaration (PCD)		4Q													
Complete Full Qualification Testing (FQT) Build 3			2Q												
Performance Assessment (PA-09)			1Q												
Performance Assessment (PA-10)			4Q												

Project: XX46 Sea Based X-Band Radar (SBX) Sustainment

MDA Exhibit R-4A (PE 0603907C)

Line Item 92 - 18 *of* 18 **UNCLASSIFIED**