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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>
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COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	979.554	390.207	428.277	450.085	-	450.085	461.759	423.843	442.926	460.112	Continuing	Continuing
MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>	784.424	244.238	254.714	277.478	-	277.478	286.650	249.844	269.197	279.424	Continuing	Continuing
MC01: <i>Cyber Operations</i>	-	0.655	0.547	0.543	-	0.543	0.557	0.565	0.573	0.594	Continuing	Continuing
MT01: <i>C2BMC Test</i>	41.520	34.776	56.237	59.172	-	59.172	53.115	56.069	53.581	55.537	Continuing	Continuing
MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>	124.092	91.287	91.111	93.097	-	93.097	99.606	95.659	95.979	99.632	Continuing	Continuing
MD40: <i>Program-Wide Support</i>	29.518	19.251	25.668	19.795	-	19.795	21.831	21.706	23.596	24.925	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note
The increase from FY 2015 to FY 2016 is attributed to increased requirements in Mid-Term Discrimination and Spiral 8.2-1 hardware/software development integration.

A. Mission Description and Budget Item Justification
The Ballistic Missile Defense Command and Control, Battle Management and Communications (C2BMC) Program establishes the System by linking together the sensors and weapons of separate elements into a layered missile defense system such that the whole is more capable and robust than the sum of its parts -- thus increasing the footprint of the Ballistic Missile Defense System (BMDS) with greater performance and defensive coverage. The C2BMC enables the BMDS to manage complex threats -- near simultaneous enemy missile shots aimed at theater, regional, or homeland assets. The systems linked through C2BMC include Patriot, Terminal High Altitude Area Defense (THAAD), Aegis Ballistic Missile Defense (BMD), Aegis Ashore, Ground Based Midcourse Defense (GMD), Army Integrated Air and Missile Defense Battle Command system (IBCS); and sensors such as the Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) radar, Sea-Based X-Band Radar (SBX), Space-Based Infrared System (SBIRS), and BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA). In FY 2014, the C2BMC Program shipped a C2BMC Deployable Interface Node (CDIN) in support of a second forward based AN/TPY-2 to the Pacific Command (PACOM). The C2BMC program will install communications, support Hardware-in-the-Loop (HWIL) integration testing, provide operations and sustainment, and training.

Based on the Missile Defense Agency's defined architectures and system specifications, the C2BMC program will provide the warfighter the capability to plan the Ballistic Missile Defense (BMD) fight while concurrently tracking all potential ballistic missile threats, and pairing any sensor with any shooter to defeat ballistic missile threats at any range, in all theaters. C2BMC battle management will deliver full AN/TPY-2 X-Band radar sensor control and capabilities for improved threat object correlation which calculates a common threat track from multiple sensors through data fusion, with sufficient data accuracy and timeliness for Ballistic Missile Defense

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<p>System (BMDS) weapon elements to enable successful engagements via Link-16 and satellite communications. The C2BMC program also works to increase coalition partners' capabilities.</p> <p>This Program Element includes support for the Discrimination Improvements for Homeland Defense (DIHD) effort. The goal of this effort is to develop and field an integrated set of Element capabilities to improve BMDS effectiveness and resilience against the evolving threat. The end result will be a future BMDS architecture more capable of discriminating and destroying a re-entry vehicle with a high degree of confidence, improving Warfighter shot doctrine and preserving inventory. This effort encompasses a Near-term, Mid-term, and Far-term DIHD capability fielding. DIHD is a combined effort between Systems Engineering, Ground-based Midcourse Defense (PE 0603882C), BMD Sensors (PE 0603884C), C2BMC (PE 0603896C), Aegis BMD (PE 0603892C) and Advanced C4ISR (PE 0603179C).</p> <p>The C2BMC will integrate the Long Range Discrimination Radar (LRDR) into the BMDS by performing sensor management of the LRDR and fusion of LRDR sensor data into the C2BMC system tracking capability. C2BMC will provision Military Satellite Communications (MILSATCOM) and redundant terrestrial communication services from C2BMC to the LRDR. C2BMC will update interfaces to provide appropriate LRDR-based information to Ground Based Missile Defense (GMD) Fire Control (GFC) and other BMDS elements.</p> <p>The C2BMC Program will expand defense of the United States, allies, and deployed forces by continuing work that enables a coordinated missile defense against short- to long- range threats in multiple regions/theaters. C2BMC capability is developed and delivered incrementally. The FY 2017 delivery (Spiral 8.2-1) supports Enhanced Homeland Defense capability by providing increased Ground-based Midcourse Defense (GMD) battlespace, Link 16 track reporting of additional sensors, enhanced sensor tasking to meet track quality and discrimination timeliness requirements to support GMD engagements, and space situational awareness tasking support. The FY 2019 delivery (Spiral 8.2-3) supports Presidential mandate EPAA Phase 3 capability declaration by providing critical sensor management and track reporting improvements to Aegis BMD Engage-on-Remote functionality, as well as integration with the new Army IAMD Battle Command System (IBCS).</p> <p>One of the best ways 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. 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 Ballistic Missile Defense (BMD) capabilities draw on space-, land-, and sea-based assets operated by multiple Services to provide the best sensor information about the enemy missiles location and track a more diverse and effective set of weapon options to be used by the Combatant Commander to defeat the attack; with all connected by a unifying Command and Control, Battle Management and Communications (C2BMC) system. As a result, an effort funded in a program element may be critical to the success of efforts in other program elements. These connections are referred to as interdependencies.</p> <p>MD40 Program-Wide Support (PWS) consists of essential non-headquarters management efforts providing integrated and efficient support to the MDA functions and activities across the entire Ballistic Missile Defense System (BMDS).</p>		

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B. Program Change Summary (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	405.319	443.484	456.182	-	456.182
Current President's Budget	390.207	428.277	450.085	-	450.085
Total Adjustments	-15.112	-15.207	-6.097	-	-6.097
• Congressional General Reductions	-	-0.207			
• Congressional Directed Reductions	-	-15.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-8.762	-			
• SBIR/STTR Transfer	-6.350	-			
• Other Adjustment	-	-	-6.097	-	-6.097

Change Summary Explanation

FY 2015 changes reflect Public Law 113-235, FY2015 Omnibus; Consolidated and Further Continuing Appropriations Act.

FY 2016 adjustments reflect realignment to Department of Defense priorities.

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency										Date: February 2015		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>	784.424	244.238	254.714	277.478	-	277.478	286.650	249.844	269.197	279.424	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

RDT&E Articles are defined as major Command and Control, Battle Management and Communications (C2BMC) capability increments (identified as a specific Spiral) which are fielded at multiple locations including Combatant Commands and other operational sites. Budget Project MD01 includes a phased progression of RDT&E articles. First, Spiral 6.4, which was successfully fielded in FY 2011/FY 2012 in NORTHCOM, PACOM, CENTCOM, and EUCOM to support multi-TPY-2 sensor management, BMDS situational awareness and battle management, and European Phased Adaptive Approach (EPAA) Phase 1 capability declaration. Spiral 6.4 is also the basis of support to EPAA Phase 2 and near-term discrimination improvements to support Homeland Defense (DIHD-N). Second, Spiral 8.2-1, which is currently in development and expected to be fielded to NORTHCOM/PACOM in FY 2017 to support Enhanced Homeland Defense. Spiral 8.2-1 provides an overall hardware and architecture refresh, new OPIR-based sensor cueing capability to provide increased Ground-based Midcourse Defense (GMD) battlespace, Link 16 track reporting of additional sensors, enhanced sensor tasking to meet track quality and discrimination timeliness requirements to support GMD engagements, and space situational awareness tasking support. The S8.2-1 infrastructure also provides significant enhancements in Information Assurance and communications robustness. Third, Spiral 8.2-3 is scheduled for a Developmental Baseline Review (DBR) in 2Q FY 2015 and is expected to be fielded to EUCOM, CENTCOM, NORTHCOM, and PACOM to support the Presidential mandate EPAA Phase 3 capability declaration in FY 2019. Spiral 8.2-3 provides critical sensor management and track reporting improvements to Aegis BMD Engage-on-Remote functionality, as well as integration with the new Army IAMD Battle Command System (IBCS). Future spirals are planned to increase robustness of sensor management, tracking, discrimination, and battle management capabilities.

Development activities culminate in three key test events: Simulation-based Verification, Site Activation Testing, and Ballistic Missile Defense System (BMDS)-wide Ground Testing. Simulation-based verification focuses on integration testing with other Ballistic Missile Defense System (BMDS) Elements. Site Activation Testing and successful participation in BMDS Ground Test campaigns verify delivery of fully functioning operational software, which is then made available for deployment.

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

A. Mission Description and Budget Item Justification

The Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to develop the plan for placement of Ballistic Missile Defense (BMD) assets. During engagement, C2BMC provides the warfighter with situational awareness of all potential ballistic missile threats, and enables engagement coordination by pairing any sensor with any shooter to defeat ballistic missile threats at any range, in all theaters. The C2BMC Program will also work to increase coalition partners' capabilities.

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The Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to develop the plan for placement of Ballistic Missile Defense (BMD) assets. During engagement, C2BMC provides the warfighter with situational awareness of all potential ballistic missile threats, and enables engagement coordination by pairing any sensor with any shooter to defeat ballistic missile threats at any range, in all theaters. The C2BMC Program will also work to increase coalition partners' capabilities.

The C2BMC Program will expand defense of the United States, allies, and deployed forces by continuing work that enables a coordinated missile defense against short-to long-range threats in multiple regions/theaters.

The Discrimination Improvements for Homeland Defense (DIHD) effort will develop and field integrated Element capabilities to improve BMD System ability to identify lethal and non-lethal objects. Command and Control, Battle Management and Communications will update C2BMC sensor tasking to support the capabilities of the Near-term phase, mature advanced discrimination and battle management techniques in support of the Mid-term and Far-term capabilities, and conduct element and system level testing to support Near, and Mid-term phases.

C2BMC delivers the following capabilities: BMDS planning, situational awareness, sensor management, and engagement coordination built to the approved BMDS specifications. The C2BMC program of work:

- Fully integrates BMD Planner and situational awareness displays with integrated intelligence information and defended asset priority schemes
- Incorporates BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA) and Space Based Infra-Red System (SBIRS) sensor data for radar and shooter (Aegis, Terminal High Altitude Area Defense (THAAD)) cueing, allowing for earlier track acquisition for the shooters.
- Updates the C2BMC model (BCM) for system-level performance assessments that have been validated against operational C2BMC performance
- Provides the Distributed Training System to provide Combatant Command (COCOM) exercise and training capabilities without scheduling downtime.
- Provides the Training Support System to provide COCOMs and schoolhouses with a flexible and small footprint training capability
- Installs more effective network monitoring, vulnerability scanning, and computer network defense software and hardware within the C2BMC Control Center (including the BMDS Network Operations and Security Center (BNOSC))
- Implements Risk Management (RM) / Information Assurance (IA) monitoring, real time analysis, and modifications of BMD devices at all C2BMC locations
- Supports system flight and ground testing in accordance with the MDA Integrated Master Test Plan (IMTP).

C2BMC ELEMENT

The Ballistic Missile Defense System (BMDS) Command and Control, Battle Management and Communications (C2BMC) provides a regional situational awareness and battle management capability at Pacific Command (PACOM), Northern Command (NORTHCOM), European Command (EUCOM), Central Command (CENTCOM), and Strategic Command (STRATCOM). C2BMC will move to a blade-based computing architecture in Spiral 8.2-1 and beyond to improve reliability, maintainability, and modularity.

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The long-term plan for the Ballistic Missile Defense (BMD) Planner is to evolve to a network enabled capability designed to interface with joint service and allied planning components. Improvements include support for rapid re-planning, enhanced mapping products and services, enhancing the interface with the Army's Air and Missile Defense Workstation (AMDWS) planner, the Navy's Maritime Integrated Air and Missile Defense Planning System (MIPS), the future Air Force Integrated Air and Missile Defense (IAMD) planner, and the North Atlantic Treaty Organization (NATO) planning systems.

C2BMC will evolve networked interfaces to expose data over the Secret Internet Protocol Router Network (SIPRNET) providing for display of individual weapon system engagement and coordination information resulting in an integrated common operating picture across the Combatant Commands (COCOMs). C2BMC will also implement network security hardware, software, and configuration management designed to meet Global Information Grid (GIG) SIPRNET connection security requirements.

C2BMC battle management will deliver full Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) Forward Based Mode (FBM) X-Band radar sensor control and capabilities:

- Improved threat object correlation which calculates a common threat track from multiple sensors through data fusion, with sufficient data accuracy and timeliness for BMDS weapon Elements to enable successful engagements via Link-16 and Extremely High Frequency (EHF) satellite communications
- Improved Interface with AN/TPY-2 Forward Based Mode (FBM) to provide greater flexibility in meeting C2BMC and Weapons System needs for Engagement Quality Data supporting Remote Engagements (EOR) with Aegis Ballistic Missile Defense (BMD).
- Incorporation of BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA) and upgraded Space Based Infra-Red System (SBIRS) sensor data to enable much earlier cueing, improve threat tracking, and source information for discrimination processing.
- Improved BMD system discrimination logic using multiple sensors' discrimination results, selecting the best result, and assigning object type to common threat tracks
- Sensor management and weapons engagement coordination aids for Remote Engagements to direct the BMDS fight and make more efficient use of limited inventory, extending the depth of fire and increasing raid defensive capabilities

C2BMC Spirals 8.2-1 and 8.2-3 Distributed Training System (DTS) planning and development enables Combatant Commands (COCOMs) to support large-scale exercises and training events without scheduling downtime of operations. The DTS will stimulate C2BMC operational screens at COCOM Air Operations Center (AOC), Maritime Operations Center (MOC), and Headquarters. Capabilities will support training with theater/regional assets and coalition partners, and updated simulations to represent current BMDS system capabilities. C2BMC Spiral 8.2-1 and Spiral 8.2-3 Training Support System (TSS) planning and development provides a flexible scenario and small footprint training system for small scale COCOM training events and schoolhouses. The TSS will integrate with Missile Warning and Air Operations Center training systems to provide an integrated training system.

The Ballistic Missile Defense (BMD) Communications Network ties together an expanding set of sensors and weapons systems enabling the National Command Authority and the commanders at the strategic, theater and tactical levels to optimally engage ballistic missile threats including near simultaneous theater, regional and homeland attacks. The BMD Communications Network provides a robust, end-to-end, high availability, operational communications network (COMNET) infrastructure

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with diverse paths that quickly and unambiguously shares information across the global Ballistic Missile Defense System (BMDS). This sharing of information is performed securely with special emphasis on preventing cyber attack via the C2BMC Control Center (including the BMDS Network Operations and Security Center (BNOSC)). The C2BMC system and networks are protected by layered defenses that start with circuits comprising the BMDS Communications Network (BCN) that are isolated from the known networks. Where the BCN and the known networks meet, layers of firewalls, encryption devices, routers and switches each with specific access control lists (ACLs), further protect the internal systems and allow only identified and approved users and systems access to the C2BMC data. Effective network management will coordinate and integrate across diverse equipment platforms, interface with other DoD communications systems, evolve information standards and capabilities, and adhere to the DoD Risk Management Framework (RMF). Defense Information Systems Agency (DISA) services are also leveraged in providing world-wide communications. Planned improvements such as dynamic real-time network management and monitoring will enable the warfighter to monitor the connection to BMDS weapons and anticipate and remedy issues as they occur.

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

	FY 2014	FY 2015	FY 2016
Title: C2BMC Development and Deployment	182.821	190.536	229.269
Articles:	-	-	-
Description: N/A			
FY 2014 Accomplishments:			
<ul style="list-style-type: none"> - Funding executed for Spirals include Prime contractor development, C2BMC Communications, C2BMC Experimentation Lab (X-Lab), and Enterprise Sensors Lab (ESL). (Spiral 6.4 \$82.213M, Spiral 8.2-1 \$83.386M, Spiral 8.2-3 \$5.184M) - Conducted Spiral 6.4 operation in the Areas of Responsibility (AORs) using BMD Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Communications Network - Completed development and fielding of Spiral 6.4 maintenance releases to support warfighter improvements in all AORs - Delivered a C2BMC Deployable Interface Node (CDIN) in support of a second forward based AN/TPY-2 deployment to PACOM. - Initiated development of Discrimination Improvements for Homeland Defense (DIHD) Near-term capability development and Element-level testing of BMDS sensor management improvements in the Command, Controls, Battle Management and Communications. - Continued Spiral 8.2 development engineering and design for BMD Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Communications Network software development, coding, and integration - Established a C2BMC-BOA Enterprise Government Reference Architecture (GRA) and Capability Evolution Roadmap to define future system enhancements in coordination with STRATCOM's Prioritized Capability List - Updated C2BMC model, validated by Critical Engagement Conditions (CECs) and Empirical Measurement Events (EMEs), for system-level performance assessments. CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations - Continued to upgrade the BMD Communications Network capability (development, integration and test) to support European Phase Adaptive Approach (EPAA) 			

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

	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Upgraded DoD teleports to enhance satellite communications (SATCOM) connectivity - Acquired and installed Enterprise Work Stations (EWS), web browsers, and BMD Planners - Continued Cyber Net Defense (CND) requirements for EPAA Phases 1 and 2 - Continued development of the BMDS C2BMC Model for Spiral 8.2 modeling and simulation - Continued development of Spiral 8.2 software, hardware, and network capability - Designed, procured, and integrated Spiral 8.2 test infrastructure and tools at Missile Defense Integration and Operations Center (MDIOC) to support Spiral 8.2 verification testing and distributed testing support - Participated in and analyzed results of ground and flight tests, wargames, and exercises in accordance with the Ballistic Missile Defense System (BMDS) Integrated Master Test Plan (IMTP). - Continued development and testing of new BMDS Overhead Persistent Infrared Architecture (BOA) baseline release to support Spiral 8.2 integration and testing - Prototyped and delivered the Two-Factor Authentication (Smart-card) capability for Spiral 8.2 on a classified weapons system. Additional improvements to remote administration of the systems, remote monitoring and event response will improve the security configuration management of this growing architecture. Automated anti-virus and patch management will allow for faster deployment of critical patches and anti-virus signatures keeping the systems secured in a timely manner. - Conducted C2BMC and NATO planning demonstrations - Supported 1 NATO live fire events - Documented international interfaces and traceability to BMDS requirements - Initiated EPAA 2 situational awareness display with Romania in accordance with bi-lateral agreements - Conducted a Systems Requirements Review (SRR) for the BMDS OPIR Architecture(BOA) Spiral 6.1 in support of extended tracking of threat missiles with new sensors contributing to EPAA Phase 3 requirements - Continued development of capabilities addressing EPAA Phase 3 requirements resulting in an upgraded Spiral with protection capability (PROCAP) functionality, record and playback and Engage on Remote support with Aegis 5.1. Development activities are scheduled for completion to support GTX-07b (FY 2018). <p>FY 2015 Plans:</p> <ul style="list-style-type: none"> - Funding for Spirals includes Prime contractor development, C2BMC Communications, C2BMC Experimentation Lab (X-Lab), and Enterprise Sensors Lab (ESL). (Spiral 6.4 \$61.018M, Spiral 8.2-1 \$97.569M, Spiral 8.2-3 \$13.802M). - Continue Spiral 8.2 engineering and design and BMD Planner, Situational Awareness, Global Engagement Manager (GEM), and BMD Communications Network software development, coding, and integration - Update C2BMC model, validated by Critical Engagement Conditions (CECs) and Empirical Measurement Events (EMEs), for system-level performance assessments. CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations 			

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

	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Continue development of Spiral 8.2 software, network capability, and hardware procurement in support of Enhanced Homeland Defense and an overall hardware and architecture refresh, new OPIR-based sensor cueing capability to provide increased Ground-based Midcourse Defense (GMD) battlespace. Spiral 8.2-1 infrastructure is required to host the Spiral 8.2-3 Engage on Remote (EOR) software which supports EPAA Phase 3. - Design, procure, and integrate Spiral 8.2 test infrastructure and tools at Missile Defense Integration and Operations Center (MDIOC) to support Spiral 8.2 verification testing and distributed testing support which provides significant enhancements in Information Assurance and communications robustness and Link 16 track reporting of additional sensors, enhanced sensor tasking to meet track quality and discrimination timeliness requirements to support GMD weapon system engagements, and space situational awareness tasking support. - Participated in and analyzed results of ground and flight tests, wargames, and exercises in accordance with the Ballistic Missile Defense System (BMDS) Integrated Master Test Plan (IMTP). - Continued development and testing of new BMDS Overhead Persistent Infrared Architecture (BOA) baseline release to support Spiral 8.2 integration and testing. - Prototyped and delivered the Two-Factor Authentication (Smart-card) capability for Spiral 8.2 on a classified - Continue to upgrade the BMD Communications Network capability (development, integration and test) to support European Phase Adaptive Approach (EPAA) - Upgrade DoD teleports to enhance satellite communications (SATCOM) connectivity - Acquire and install Enterprise Work Stations (EWS), web browsers, and BMD Planners - Continue Cyber Net Defense (CND) requirements for EPAA Phases 1 and 2 - Continue development of the BMDS C2BMC Model for Spiral 8.2 modeling and simulation - Continue development of Spiral 8.2 software, hardware, and network capability - Design, procure, and integrate Spiral 8.2 test infrastructure and tools at Missile Defense Integration and Operations Center (MDIOC) to support Spiral 8.2 verification testing and distributed testing support - Participate in and analyze results of ground and flight tests, wargames, and exercises in accordance with the Ballistic Missile Defense System (BMDS) Integrated Master Test Plan (IMTP). - Continue development and testing of new BMDS Overhead Persistent Infrared Architecture (BOA) baseline release to support Spiral 8.2 integration and testing - Complete development and fielding of new Spiral 6.4 maintenance release to support warfighter improvements - Spiral 8.2 will develop the Two-Factor Authentication (Smart-card) capability on a classified weapon system. Additional improvements to remote administration of the systems, remote monitoring and event response will improve the security configuration management of this growing architecture. Automated anti-virus and patch management will allow for faster deployment of critical patches and anti-virus signatures keeping the systems secured in a timely manner. - Continue to document international interfaces and traceability to BMDS requirements 			

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

	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Continue EPAA Phase 2 situational awareness displays project IAW bi-lateral agreements - Initiate C2BMC and NATO planning demonstrations - Continue to support NATO live fire events - Continue development of capabilities addressing EPAA Phase 3 requirements resulting in an upgraded Spiral with plan load during operations, protection capability (PROCAP) functionality, record and playback, a BOA release (6.1 or later), and Engage on Remote support with Aegis 5.1. - Continue requirements allocation and specification for advanced C2BMC technologies to exploit space-based data - Continue site planning, scheduling and hardware acquisition to support planned FY 2017 deployment of C2BMC Spiral 8.2-1 capability. - Complete Discrimination Improvements for Homeland Defense (DIHD) Near-term capability development and Element-level testing of BMDS sensor management improvements in the Command, Controls, Battle Management and Communications. - Complete integration phase of DIHD Near-term testing via GTI-06. - Conduct data collection and analysis for final assessment of discrimination technology candidates planned for DIHD Mid-term improvements. - Continue system maturation and performance characterization of the Simultaneous Correlation of Unambiguous Tracks (SCOUT) Algorithm and the Advanced SCOUT Prototype (ASP) node, a selected component of the MDA initiative for Mid-Term DIHD initiated in FY14 within PE 06031719C, Advanced C4ISR. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Funding for Spirals includes Prime contractor development, C2BMC Communications, C2BMC Experimentation Lab (X-Lab), and Enterprise Sensors Lab (ESL). (Spiral 6.4 \$55.022M, Spiral 8.2-1 \$83.301M, Spiral 8.2-3 \$53.959M). <p>The increase from FY 2015 to FY 2016 is attributed to allocated increased threat requirements in Mid-Term Discrimination, increased DIHD effort to include maturing advanced discrimination and battle management techniques in support of the Mid-term and Far-term capabilities and Spiral 8.2-1 hardware/software development integration.</p> <p>C2BMC International Partner System Engineering</p> <ul style="list-style-type: none"> - Continue to document international interfaces and traceability to BMDS requirements - Continue to conduct C2BMC and North Atlantic Treaty Organization (NATO) planning demonstrations - Continue to support NATO live fire events - Continue EPAA Phase 2 situational awareness displays project in accordance with bi-lateral agreements <p>C2BMC Spiral 6.4 Maintenance</p>			

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

	FY 2014	FY 2015	FY 2016
<p>- Complete development and fielding of new Spiral 6.4 maintenance release to support warfighter improvements and required security updates and vulnerability corrective actions</p> <p>C2BMC Spiral 8.2 Development, Verification Testing, and Deployment</p> <ul style="list-style-type: none"> - Spiral 8.2-1 was baselined at a Developmental Baseline Review (DBR) in August 2012 - Continue Spiral 8.2-1 product development to include BMD Planner, Situational Awareness, Global Engagement Manager (GEM), Boost Phase Cue and BMD Communications Network software. - Continue development of Spiral 8.2 software, hardware, and network capability - Enhance Spiral 8.2-1 through prototyping and delivery of critical RMF requirements to include Two-Factor Authentication (Smart-card) capability on a classified weapon system, remote administration of the systems, remote scanning, monitoring and event response, and automated anti-virus and patch management - Continue the design, procurement, and integration of Spiral 8.2-1 test infrastructure and tools at Missile Defense Integration and Operations Center (MDIOC) to support Spiral 8.2-1 verification testing and distributed testing support - Provide pre-test engineering and analyze results of ground and flight tests, wargames, and cyber range / other exercises in accordance with the Ballistic Missile Defense System (BMDS) Integrated Master Test Plan (IMTP) - Continue site planning, scheduling and hardware acquisition to support planned FY 2017 Northern Command (NORTHCOM)/ Pacific Command (PACOM) deployment of the C2BMC Spiral 8.2-1 capability <p>- Initiate Spiral 8.2-3 engineering and design for the development of capabilities addressing European Phased Adaptive Approach (EPAA) Phase 3 requirements for Engage-on-Remote (EOR), integration of BOA 6.1 wideband extended tracking, integration of the Army IBCS program, and two Warfighter Improvement Process upgrades (NORTHCOM protection capability (PROCAP) functionality and record and playback functionality). Capability improvements will include modifications to C2BMC track processing, Link-16 track reporting, sensor resource management, and mission planning. Engineering efforts will include planning for initial Spiral 8.2 infrastructure deployment to CENTCOM and EUCOM areas of responsibility (AOR).</p> <p>C2BMC Modeling and Simulation</p> <ul style="list-style-type: none"> - Continue development of the BMDS C2BMC Model for Spiral 8.2 modeling and simulation - Update C2BMC model, validated by Critical Engagement Conditions (CECs) and Empirical Measurement Events (EMEs), for system-level performance assessments. CEC/EMEs are the conditions and events where data is obtained from flight and ground tests in order to anchor system models and simulations - Complete development of S8.2-1 C2BMC Model (BCM 8.2-1) - Perform initial Verification and Validation of S8.2-1 C2BMC Model with BC-generated referent data - Begin the initial development of S8.2-3 C2BMC Model (BCM 8.2-3) 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<p>BMDS Overhead Persistent Infrared Architecture (BOA)</p> <ul style="list-style-type: none"> - Continue testing of new BMDS Overhead Persistent Infrared Architecture (BOA) 5.1 baseline release to support Spiral 8.2-1 integration and testing - Demonstrate BOA 5.1 capabilities with BMDS elements in the GTX-07 ground test as a pre-condition for operational fielding in FY 2019 - Complete BOA 6.1 development to extend Overhead Persistent Infrared Radar (OPIR) tracks and complete the requirements verification test and analysis - Install BOA 6.1 in an operationally relevant environment to conduct soak testing with live OPIR feeds - Conduct BOA 6.1 requirements verification and performance characterization to support readiness for operational installation in FY 2019. - - Evaluate Enterprise Sensors Lab (ESL) prototypes that extract dimmer targets from sensor data for inclusion in future BOA spirals - Conduct BOA 7.1 system requirements review to incorporate wideband sensor data capabilities yielding improved threat tracking - Continue requirements allocation and specification for advanced C2BMC technologies to exploit space-based data <p>Discrimination Improvements for Homeland Defense (DIHD)</p> <ul style="list-style-type: none"> - Complete Near-term DIHD capability development and Element-level testing of Ballistic Missile Defense System (BMDS) sensor management improvements in the Command and Control, Battle Management and Communications - Complete integration phase of Near-term DIHD testing via the GTI-06 ground test campaign - Conduct data collection and analysis for final assessment of discrimination technology candidates planned for DIHD Mid-term improvements - Continue system maturation and performance characterization of the Simultaneous Correlation of Unambiguous Tracks (SCOUT) Algorithm and the Advanced SCOUT Prototype (ASP) node, a selected component of the MDA initiative for Mid-Term DIHD <p>DIHD Mid-term improvements</p> <ul style="list-style-type: none"> - Participate in Far-term DIHD threat models specification. - Develop model/prototype of Far-term DIHD System Level Discrimination in support of the Far-term DIHD capabilities. - Participate in planning and conduct technology trades and analysis to refine capabilities to mitigate the Far-term DIHD threats. - Conduct System Requirements Review for Far-term DIHD C2BMC capabilities. <p>Long Range Discrimination Radar (LRDR)</p>			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Integrate the Long Range Discrimination Radar (LRDR) into the BMDS by performing sensor management of the LRDR and fusion of LRDR sensor data into the C2BMC system tracking capability - Provision Military Satellite Communications (MILSATCOM) and redundant terrestrial communication services from C2BMC to the LRDR - Update interfaces to provide appropriate LRDR-based information to Ground Based Missile Defense (GMD) Fire Control (GFC) and other BMDS elements 			
<p>Title: C2BMC Experimentation Lab (X-Lab)</p> <p align="right">Articles:</p> <p>Description: N/A</p> <p>FY 2014 Accomplishments: The C2BMC Experimentation Lab (X-Lab) prototypes and demonstrates new C2BMC capabilities. The FY 2014 development accomplishments are noted below and were supported with test events funded through Project MT01:</p> <ul style="list-style-type: none"> - Evaluated algorithms and data distribution architectures for transmitting system tracks that included features in simulations, experiments, and associated operations during test events, this enabled weapon systems to form Target Object Maps that allowed an engagement beyond line of sight of the organic radar to utilize the full extent of the physical range of the interceptor (Engage-on-Remote) - Developed interfaces and data distribution architectures that implemented a common cueing protocol with the Joint Overhead Persistent Infra-Red (OPIR) Ground (JOG), Space Based Infra-Red System (SBIRS), and MDA system architectures. Experimentation analysis indicates BMDS benefits to include improved efficiency in cueing - Characterized the performance of engineering releases of C2BMC Spiral 8.2 providing risk mitigation throughout the Spiral development activities. <p>FY 2015 Plans: The C2BMC Experimentation Lab (X-Lab) prototypes and demonstrates new C2BMC capabilities. The FY 2015 focus will be:</p> <ul style="list-style-type: none"> - Demonstrate algorithms and data distribution architectures for transmitting system tracks that include features. This will enable weapon systems to form Target Object Maps that allow an engagement beyond line of sight of the organic radar to utilize the full extent of the physical range of the interceptor (Engage-on-Remote) - Evaluate interfaces and data distribution architectures that implement a common cueing protocol with the Joint Overhead Persistent Infra-Red (OPIR) Ground (JOG), Space Based Infra-Red System (SBIRS), and MDA system architectures to improve efficiency in cueing, increase battlespace for Homeland Defense, and decrease C2BMC sustainment costs - Characterize the performance of engineering releases of C2BMC Spiral 8.2 to mitigate risks early in the development and integration processes 	4.733 -	6.416 -	5.051 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<p>Advanced C4ISR technology products completed in FY 2014 will transition to C2BMC and Sensors Program Elements. The Agency will continue to investigate enabling technology for the integration of the Services command and sensor networks into the Ballistic Missile Defense System (BMDS) in the C2BMC Program Element.</p> <p>FY 2016 Plans: The decrease in funding from FY 2015 to FY 2016 is attributed to transition of SBIRS Increment 2 from development to operations.</p> <p>The C2BMC Experimentation Lab (X-Lab) prototypes and demonstrates new C2BMC capabilities. The FY 2016 focus will be:</p> <ul style="list-style-type: none"> - Evaluate the efficacy of virtualization when applied to the C2BMC mission node, in terms of mission performance and the potential for reduction of Operations and Sustainment (O&S) costs - Evaluate Engage-on Remote performance in a series of flight and ground tests - Evaluate prototype advanced sensor and hit assessment technologies - Evaluate multi-sensor source track fusion to improve efficiency in cueing, increase battlespace for Homeland Defense, and decrease C2BMC performance risks - Evaluate interfaces and data distribution architectures that implement a common cueing protocol with the Joint Overhead Persistent Infra-Red (OPIR) Ground (JOG), Space Based Infra-Red System (SBIRS), and MDA system architectures to improve efficiency in cueing, increase battlespace for Homeland Defense, and decrease C2BMC sustainment costs - Assess Link-16 engagement coordination capabilities for planning and managing the execution of Link-16 remote engagements, to include Engage-on Remote - Assess alternative approaches for coordinating strategic sensor task planning, execution and coordination with missile defense regional COCOM tasking priorities - Characterize the performance of engineering releases of C2BMC Spiral 8.2-1 to mitigate risks early in the development and integration processes - Implement systems and network connection security requirements to mitigate connectivity risks early in the development process 			
<p>Title: C2BMC Communications</p> <p align="right">Articles:</p> <p>Description: N/A</p> <p>FY 2014 Accomplishments:</p>	39.223	42.859	30.836
	-	-	-

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

	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Designed redundant fiber path in support of Clear Air Force Station (AFS) Upgraded Early Warning Radar (UEWR) integration into the Ballistic Missile Defense System (BMDS) - Provided Ground-Based Midcourse Defense (GMD) Communications Network (GCN) Long Haul Communications Transport (LHCT) Services - Installed and tested AN/GSC-52B SATCOM terminal, Modernization Enterprise Terminal #1 (MET#1), at Ramstein AFB for connectivity via Indian Ocean Defense Satellite Communication System (DSCS) - Continued support for C2BMC 6.4 in the European Command (EUCOM), Strategic Command (STRATCOM), Northern Command (NORTHCOM), Pacific Command (PACOM), and Central Command (CENTCOM) - Completed and deployed the C2BMC Deployable Interface Node (CDIN) (C2BMC Element funded software capability and project management) and associated Long Haul Communications Transport (LHCT) in support of 2nd Radar deployment to Japan. - Participated in and analyzed results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP) - Resolved real-time operational issues through the C2BMC Control Center (CCC) (includes BMDS Network Operations and Security Center (BNOSC)) - Provided global BMDS communications via leased Defense Information Systems Agency (DISA) circuit - Provided SME support to fielded C2BMC locations to ensure continued performance and operations - Provided sustaining engineering support for fielded network equipment - Provided support of AN/TPY-2 radar communications nodes to ensure continued performance and operations - Upgraded LHCT services at AN/TPY-2 locations in CENTCOM and EUCOM to provide redundant and diverse paths - Designed and implemented changes at C2BMC suite locations to accommodate changes to the Navy's Automated Digital Network System (ADNS) INC III <p>FY 2015 Plans:</p> <ul style="list-style-type: none"> - Provide Ground-Based Midcourse Defense (GMD) Communications Network (GCN) Long Haul Communications Transport (LHCT) Services - Continue engineering support to AN/GSC-52B SATCOM terminal, Modernization Enterprise Terminal (MET), at Ramstein AFB for connectivity via Indian Ocean Defense Satellite Communication System (DSCS) - Continue network and communications support for C2BMC 6.4 in the European Command (EUCOM), Strategic Command (STRATCOM), Northern Command (NORTHCOM), Pacific Command (PACOM), and Central Command (CENTCOM) - Continue engineering and deployment support of C2BMC Deployable Interface Nodes (CDINs) (C2BMC Element funded software capability and project management) 			

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

	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Participate in and analyze results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP) - Resolve real-time operational issues through the C2BMC Control Center (CCC) (includes BMDS Network Operations and Security Center (BNOSC)) - Provide global BMDS communications via leased Defense Information Systems Agency (DISA) circuit - Provide SME support to fielded C2BMC locations to ensure continued performance and operations - Provide sustaining engineering support for fielded network equipment - Provide support of AN/TPY-2 radar communications nodes to ensure continued performance and operations including installation of new AN/TPY-2 radar communications node at a site in Japan and installation and support of AN/GSC-52B SATCOM terminals, Modernization of Enterprise Terminal-Transportable (MET-T), at a site in Japan - Acquisition of network circuits to support planned FY 2017 S8.2 capability deployment - Fielding of protected Anti-Jam (AJ) /Anti-Scintillation (AS) Wideband Network System (PAAWNS) to missile defense locations worldwide - Install improved LHCT at 2nd AN/TPY-2 radar location in Japan <p>FY 2016 Plans: The decrease between FY 2015 and FY 2016 funding was due to the planned FY 2015 completion of the following: Site K SATCOM installation and checkout, Site KCS deployment and activation, Aegis Ashore (Romania) terrestrial fiber communication trunks, Japanese Host Nation Interface (HNI) changes to add a connection to Commander, Naval Forces Japan (CNFJ), Shariki transition from ATM to optical network interface, and the Shariki circuit leases transfer to the Army.</p> <ul style="list-style-type: none"> - Provide Ground-Based Midcourse Defense (GMD) Communications Network (GCN) Long Haul Communications Transport (LHCT) Services - Continue engineering support to AN/GSC-52B SATCOM terminal, Modernization Enterprise Terminal (MET), at Ramstein Air Force Base (AFB) for connectivity via Indian Ocean Defense Satellite Communication System (DSCS) - Continue network, communications and risk management support for C2BMC Spiral 6.4 in the European Command (EUCOM), Strategic Command (STRATCOM), Northern Command (NORTHCOM), Pacific Command (PACOM), and Central Command (CENTCOM) - Continue engineering and deployment support of C2BMC Deployable Interface Nodes (CDINs) (C2BMC Element funded software capability and project management) - Participate in and analyze results of ground and flight tests, wargames, cyber range /other exercises in accordance with the BMDS Integrated Master Test Plan (IMTP) 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Resolve real-time operational issues through the C2BMC Control Center (CCC) (includes BMDS Network Operations and Security Center (BNOSC)) - Provide global BMDS communications via leased Defense Information Systems Agency (DISA) circuit - Provide Subject Matter Expert (SME) support to fielded C2BMC locations to ensure continued performance and operations - Provide sustaining engineering support for fielded network equipment to include required security maintenance - Provide support of Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) radar communications nodes to ensure continued performance and operations including installation of new AN/TPY-2 radar communications node at a site in Japan and installation and support of AN/GSC-52B SATCOM terminals, Modernization of Enterprise Terminal-Transportable (MET-T), at a site in Japan - Acquire network circuits to support planned FY 2017 Spiral 8.2 capability deployment - Continue fielding of Protected Anti-Jam (AJ) / Anti-Scintillation (AS) Wideband Network System (PAAWNS) to missile defense locations worldwide - Continue to upgrade the BMD Communications Network capability (development, integration and test) to support European Phase Adaptive Approach (EPAA) - Continue to upgrade DoD teleports to enhance satellite communications (SATCOM) connectivity - Continue Cyber Net Defense (CND) requirements for Homeland Defense EPAA Phases 1 and 2 			
<p>Title: Enterprise Sensors Lab (ESL)</p> <p align="right">Articles:</p> <p>Description: N/A</p> <p>FY 2014 Accomplishments: The Enterprise Sensors Lab (ESL) prototypes and demonstrates algorithms that fuse space, airborne, and terrestrial-based sensor data to provide three-dimensional (3-D) tracks of threat missiles to enable sensor cueing and Launch/Engage-on-Remote (LOR/EOR) using all sensors. Additionally, ESL extracts features in support of hit assessment with a goal of enabling a shoot-look-shoot capability. During FY 2014 the ESL: :</p> <ul style="list-style-type: none"> - Developed prototype and pathfinder software incorporating the Space Based Infra-Red System (SBIRS) Geosynchronous Earth Orbit (GEO) Starer, other new Overhead Persistent Infra-Red (OPIR) sensors, and SBIRS Highly Elliptical Orbit (HEO) Wideband Data to extend and enhance the accuracy of 3-D tracks and provide a foundation for future BMDS OPIR Architecture (BOA) builds - Initiated a joint Infrared/Radio Frequency algorithm library to enable sensor data fusion to be incorporated into multiple systems with improved efficiency and reduced maintenance costs 	17.461	14.903	12.322
	-	-	-

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

	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Prototyped algorithms to extract dimmer targets from sensor data to extend the length of the track and enable additional sensor cueing opportunities - Developed a prototype interface for integrating the Discrimination Sensor Technology (DST) MQ-9 Reaper hosted sensor into the Ballistic Missile Defense System (BMDS) and supported the first airborne data collect, performed ad hoc on an Atlas V launch, to reduce risk for an accelerated test schedule commencing in the 1st quarter FY 2015. - NOTE: FY 2013 \$12.5 million from PE0604883C executed in FY 2014 in support of ESL <p>FY 2015 Plans: The Enterprise Sensors Lab (ESL) prototypes and demonstrates algorithms that fuse space, airborne, and terrestrial-based sensor data to provide three-dimensional (3-D) tracks of threat missiles to enable sensor cueing and Launch/Engage-on-Remote (LOR/EOR) using all sensors. Additionally, ESL extracts features in support of hit assessment with a goal of enabling a shoot-look-shoot capability.</p> <ul style="list-style-type: none"> - Execute deferred FY 2014 efforts including critical independent analysis, algorithm development and source data product tasks - Incorporate the Space Based Infra-Red System (SBIRS) Geosynchronous Earth Orbit Scanner Wideband Data and other new Overhead Persistent Infra-Red (OPIR) sensors data feeds to form a more accurate 3-D track - Demonstrate joint Infrared/Radio Frequency algorithms in playbacks of prior flight test to assess sensor data fusion of multiple systems with improved efficiency and reduced maintenance costs - Enhance prototype algorithms to extract dimmer targets from sensor data to extend the length of the track and enable additional sensor cueing opportunities <p>FY 2016 Plans: The Enterprise Sensors Lab (ESL) and supporting activities prototype and demonstrate algorithms that fuse space, airborne, and terrestrial-based sensor data to provide three-dimensional (3-D) tracks of threat missiles to enable sensor cueing and Launch/Engage-on-Remote (LOR/EOR) using all sensors. Additionally, ESL extracts features in support of hit assessment with a goal of enabling a shoot-look-shoot capability</p> <ul style="list-style-type: none"> - Continue to incorporate the Space Based Infra-Red System (SBIRS) Geosynchronous Earth Orbit (GEO) Scanner Wideband and other new Overhead Persistent Infra-Red (OPIR) sensors data feeds to form a more accurate 3-D track - Initiate integration of SBIRS GEO Starer Wideband sensor data to form a more accurate 3-D track - Prototype hit assessment algorithms based on a fusion of enterprise sensor data to enable a shoot-look-shoot capability - Prototype algorithms for fusing joint Infrared/Radio Frequency systems measurement data real-time to enhance 3-D tracking of threat missiles 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
- Continue to enhance prototype algorithms to extract dimmer targets from sensor data to extend the length of the track and enable additional sensor cueing opportunities			
Accomplishments/Planned Programs Subtotals	244.238	254.714	277.478

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

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 0603177C: <i>Discrimination Sensor Technology</i>	29.642	36.610	28.200	-	28.200	-	-	-	-	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	35.421	13.284	9.876	-	9.876	3.723	-	-	-	-	62.304
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	251.899	163.892	228.021	-	228.021	230.306	257.014	218.533	247.707	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,064.445	873.923	1,284.891	-	1,284.891	936.425	803.392	903.539	912.890	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	340.391	270.901	233.588	-	233.588	228.437	142.363	140.740	141.733	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	885.704	764.224	843.355	-	843.355	762.740	748.354	564.827	579.585	Continuing	Continuing
• 0603893C: <i>Space Tracking and Surveillance System</i>	41.618	31.331	31.632	-	31.632	17.917	23.937	28.789	30.344	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	6.412	6.389	23.289	-	23.289	21.433	16.108	11.933	11.952	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	50.271	58.503	49.211	-	49.211	58.074	53.655	55.194	57.162	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	70.336	64.409	72.866	-	72.866	71.267	75.760	72.319	87.058	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	342.695	366.302	274.323	-	274.323	298.390	345.333	330.404	350.747	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	501.170	455.068	513.256	-	513.256	585.727	484.242	442.202	460.945	Continuing	Continuing

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

<u>Line Item</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u> <u>Base</u>	<u>FY 2016</u> <u>OCO</u>	<u>FY 2016</u> <u>Total</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
Remarks											

D. Acquisition Strategy

The Command and Control, Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of 2nd quarter 2012 through 1st quarter 2017. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency											Date: February 2015				
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>						

Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - BOA Development	SS/CPAF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	0.000	-		6.573	Oct 2014	6.221		-		6.221	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Hardware/Software Development, Integration & Test (I&T)	SS/IDIQ	Lockheed Martin Team : Arlington, VA	226.340	99.750		104.884		135.468		-		135.468	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Integration	Various	Services DISA Agency : -	127.760	19.789		6.549		-		-		-	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Mid-Term DIHD-SCOUT	SS/CPFF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	0.000	-		9.751	Oct 2014	19.377		-		19.377	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Mid-Term DIHD-SCOUT OGA	MIPR	Aviation and Missile Research Development and Engineering Center : Huntsville, AL	0.000	-		1.200	Oct 2014	1.200		-		1.200	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Contract Support Services	SS/FFP	Cobham Analytic Solutions, Paradigm, CACI, CSC : Arlington, VA/ Huntsville, AL	156.463	24.338		22.561		24.505		-		24.505	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Federally Funded Research & Development Centers / University Affiliated Research Center	MIPR	MITRE, IDA, ORNL, Aerospace, JHU/APL, GTRI : Arlington, VA/ Huntsville, AL/ Colorado Springs, CO	92.709	16.140		16.470		14.891		-		14.891	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C2BMC Development and Deployment - IT User Services	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	0.000	-		-		4.898	Oct 2015	-		4.898	Continuing	Continuing	Continuing
C2BMC Development and Deployment - MDA Civilian, Travel & PCS	Various	- : Arlington, VA/ Huntsville, AL/ Colorado Springs, CO	59.983	22.804		22.548		22.709		-		22.709	Continuing	Continuing	Continuing
C2BMC Experimentation Lab (X-Lab) - X-Lab	SS/CPAF	Various / Northrop Grumman Mission Systems : Colorado Springs, CO	31.408	4.733		6.416		5.051		-		5.051	Continuing	Continuing	Continuing
C2BMC Communications - Communication Equipment and Fielding	SS/CR	DISA, PMDCATS, SPAWAR : Various	56.031	25.250		28.988		20.071		-		20.071	Continuing	Continuing	Continuing
C2BMC Communications - BNOSC	SS/CPAF	Lockheed Martin Team / JRDC : Colorado Springs, CO	13.167	3.224		3.353		3.071		-		3.071	Continuing	Continuing	Continuing
C2BMC Communications - Communication Leases	SS/CR	DISA : Arlington, VA	12.343	8.949		7.993		7.194		-		7.194	Continuing	Continuing	Continuing
C2BMC Communications - EUCOM Communications	MIPR	USAFE : Ramstein, DE	8.220	1.800		2.525		0.500		-		0.500	Continuing	Continuing	Continuing
Enterprise Sensors Lab (ESL) - Enterprise Sensor Lab	SS/CPAF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	0.000	17.461		14.903		12.322		-		12.322	Continuing	Continuing	Continuing
Subtotal			784.424	244.238		254.714		277.478		-		277.478	-	-	-

Remarks
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Support (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Test and Evaluation (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	784.424	244.238	254.714	277.478	-	277.478	-	-	-

Remarks

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

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

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

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
MD01 Command & Control, Battle Management, Communications (C2BMC)									✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD01 Command & Control, Battle Management, Communications (C2BMC)	1	2016	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency										Date: February 2015		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MC01 / <i>Cyber Operations</i>			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
MC01: <i>Cyber Operations</i>	-	0.655	0.547	0.543	-	0.543	0.557	0.565	0.573	0.594	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project MC01 is a new Defensive Cyber Operations Project established in this Program Element (PE) for PB 2014. Funds were previously reported in Project MD01 of this PE

A. Mission Description and Budget Item Justification

The funds in this project sustain Missile Defense Agency (MDA) Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA Command and Control, Battle Management and Communications (C2BMC) mission systems. It maintains the Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&M on all MDA information systems.

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

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

	FY 2014	FY 2015	FY 2016
Title: Network/System Certification and Accreditation (C&A)	0.655	0.547	0.543
Articles:	-	-	-
Description: The funds in this project sustain Missile Defense Agency (MDA) Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA Command and Control, Battle Management and Communications (C2BMC) mission systems. It maintains the Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&M on all MDA information systems.			
This project supports the monitoring and tracking of Cybersecurity mitigations detailed in Information Technology security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<p>Information Assurance Officer (SIAO)/Certification Authority (CA) and DAA. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).</p> <p>FY 2014 Accomplishments:</p> <ul style="list-style-type: none"> - Conducted cyber security / information assurance engineering and architecture planning for C2BMC information technology systems. - Planned and tested the IA controls for Ballistic Missile Defense System (BMDS) C2BMC systems. - Developed C2BMC DIACAP certification and accreditation packages. - Conducted Controls Validation Testing (CVT) of C2BMC mission systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies. - Conducted annual information assurance reviews on the C2BMC enclaves to assess compliance in implementing and maintaining IA controls. - Conducted enterprise cyber range environment cybersecurity experiments to assess and improve network defense. <p>FY 2015 Plans:</p> <ul style="list-style-type: none"> -Conduct cyber security / information assurance engineering and architecture planning for C2BMC information technology systems. -Plan and test the IA controls for Ballistic Missile Defense System (BMDS) C2BMC systems. -Develop C2BMC DIACAP certification and accreditation packages. -Conduct Controls Validation Testing (CVT) of C2BMC mission systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies. -Conduct annual information assurance reviews on the C2BMC enclaves to assess compliance in implementing and maintaining IA controls. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> -Conduct cyber security / information assurance (IA) engineering and architecture planning for C2BMC information technology systems. -Plan and test the information assurance (IA) controls for Ballistic Missile Defense System (BMDS) C2BMC systems. -Develop C2BMC Risk Management Framework (RMF) certification and accreditation packages. -Conduct Controls Validation Testing (CVT) of C2BMC mission systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
-Conduct annual information assurance reviews on the C2BMC enclaves to assess compliance in implementing and maintaining IA controls.			
Accomplishments/Planned Programs Subtotals	0.655	0.547	0.543

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

N/A

Remarks

D. Acquisition Strategy

The Command and Control, Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of 2nd quarter 2012 through 1st quarter 2017. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>
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Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network/System Certification and Accreditation (C&A) - IA/ CND Network/System C&A	C/CPFF	Torch Technologies : Various	0.000	0.655		0.547		0.543		-		0.543	Continuing	Continuing	Continuing
Subtotal			0.000	0.655		0.547		0.543		-		0.543	-	-	-

Remarks
N/A

	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.655	0.547	0.543	-	0.543	-	-	-

Remarks
N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>
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Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
 Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
MC01 Cyber Operations									✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC01 Cyber Operations	1	2016	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency										Date: February 2015		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MT01 / <i>C2BMC Test</i>			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
MT01: <i>C2BMC Test</i>	41.520	34.776	56.237	59.172	-	59.172	53.115	56.069	53.581	55.537	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

TESTING

To ensure Command and Control, Battle Management and Communications (C2BMC) capabilities delivered are consistent with the Prioritized Capabilities List and are interoperable with other Ballistic Missile Defense System (BMDS) components, C2BMC will support system flight and ground testing, and wargames and exercises as detailed in the MDA Integrated Master Test Plan (IMTP).

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

	FY 2014	FY 2015	FY 2016
Title: Integrated Master Test Plan	34.776	56.237	59.172
Articles:	-	-	-
Description: N/A			
FY 2014 Accomplishments:			
- Participated in and analyzed results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP)			
- Planned, collected data, assessed, examined, and reported on C2BMC spiral integration testing			
- Supported interoperability and integration of the BMDS program elements			
- Supported the field testing of the European and Central Command Deployments			
- Supported European Phased Adaptive Approach (EPAA) Phase 2-3 Situational Awareness (SA) Node deployments			
- Provided infrastructure, network, and troubleshooting support to:			
-- C2BMC Command Center (CCC) (Includes BMDS Network Operations and Security Center (BNOSC))			
-- System Test and Operations Center (STOC)			
-- Ballistic Missile Defense System (BMDS) Communications Network (BCN)			
-- Distributed Multi-Echelon Distributed Training system (DMETS)			
-- Distributed Training system (DTS)			
- Completed build-out of Spiral 8.2 EUCOM Testbed in preparation for Verification Testing			
- Continued BMD Overhead Persistent Infra-Red (OPIR) Architecture (BOA) performance assessments, integration, and testing			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

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

	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Conducted concept development test for virtualized C2BMC services, service oriented architectures - Conducted Exercise Rapid Arrow 2014 German/Dutch Live Fire Event - Completed Cyber Testing modification to the C2BMC Testbed (CTB) and accomplished 3 events <p>Enterprise Sensors Laboratory (ESL): Project MT01 funds test operations for the capabilities established in the Enterprise Sensors Laboratory and described in Project MD01. In FY14, the ESL accomplished the following:</p> <ul style="list-style-type: none"> - Participated in three major Missile Defense Agency (MDA) flight tests, one MDA ground test, and collected real-world data on numerous targets of opportunity (TOO) to support advanced processing prototyping, to anchor modeling & simulation (M&S) capabilities, and to provide data for assessment activities - Compiled and provided test and demonstration results back to the algorithm and software development activity in Project MD01 to enable algorithm refinement <p>C2BMC Experimentation Lab (X-Lab):</p> <ul style="list-style-type: none"> - Demonstrated maturing C2BMC technologies and software builds through two flight tests, one ground test and three real-world targets of opportunities before incorporation into formal C2BMC spiral builds. Project MT01 funded the test operations for the capabilities established in the X-Lab facility and described in Project MD01. - Planned, coordinated, and provided test operations utilizing maturing C2BMC technologies to produce data that enabled evaluation of architecture schemas for system track data distribution and common cueing protocols across the Joint OPIR Ground (JOG), Space Based Infra-Red System (SBIRS), and MDA system architectures. - Hosted and tested Spiral 8.2 engineering releases then compiled and provided test and demonstration results back to the development activity in Project MD01 for architecture refinement activities and Spiral 8.2 performance evaluation and characterization analysis <p>FY 2015 Plans: Participate in and analyze results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP)</p> <ul style="list-style-type: none"> - Plan, collect data, assess, examine, and report on C2BMC spiral integration testing - Support interoperability and integration of the BMDS program elements - Support the field testing of the European and Central Command Deployments - Support European Phased Adaptive Approach (EPAA) Phase 2-3 Situational Awareness (SA) Node deployments - Provide infrastructure, network, and troubleshooting support to: <ul style="list-style-type: none"> -- C2BMC Command Center (CCC) (Includes BMDS Network Operations and Security Center (BNOSC)) 			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> -- System Test and Operations Center (STOC) -- Ballistic Missile Defense System (BMDS) Communications Network (BCN) -- Distributed Multi-Echelon Distributed Training system (DMETS) Infrastructure -- Distributed Training system (DTS) - Complete build-out of Spiral 8.2 Testbed for IMTP scheduled events - Continue C2BMC and NATO planning demonstrations - Continue to support NATO live fire events - Continue development and upgrades for Cyber Testing in the C2BMC Testbed (CTB) <p>Enterprise Sensors Laboratory (ESL):</p> <ul style="list-style-type: none"> -Demonstrate prototype algorithms for track and measurement level sensor data fusion and feature extraction through flight tests, ground tests and real-world targets of opportunities before incorporation into formal C2BMC spiral builds. Project MT01 funds test operations for the capabilities established in the Enterprise Sensors Laboratory and described in Project MD01. -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable assessments of track accuracy improvements resulting from incorporation of Space Based Infra-Red System (SBIRS) Geosynchronous Earth Orbit Scanner Wideband and other new Overhead Persistent Infra-Red (OPIR) sensor data feeds -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable effectiveness evaluations of sensor data fusion enabled through the incorporation of radio frequency data into the existing ESL Infrared three-dimension track formulation processes. -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable characterization of the capability to extract information from observations of dim upper stages of threat systems and the ability to exploit features extracted from available sensor resource data. -Compile and provide test and demonstration results back to the algorithms development activity in Project MD01 to enable algorithm refinement <p>C2BMC Experimentation Lab (X-Lab):</p> <ul style="list-style-type: none"> - Demonstrate maturing C2BMC technologies and software builds through flight tests, ground tests and real-world targets of opportunities before incorporation into formal C2BMC spiral builds. Project MT01 funds the test operations for the capabilities established in the X-Lab facility and described in Project MD01. -Plan, coordinate, and provide test operations utilizing maturing C2BMC technologies to produce data to enable evaluation of architecture schemas for system track data distribution and common cueing protocols across the Joint OPIR Ground (JOG), Space Based Infra-Red System (SBIRS), and MDA system architectures. -Host and test Spiral 8.2 engineering releases 			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

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

	FY 2014	FY 2015	FY 2016
<p>-Compile and provide test and demonstration results back to the development activity in Project MD01 for architecture refinement activities and Spiral 8.2 performance evaluation</p> <p>Wargames Participate in and analyze results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP)</p> <p>Program, Planning & Operations M&S participation in System Test Events -Support and analyze models and simulation in accordance with the BMDS IMTP Integrated Master Assessment Plan (IMAP): - Continue development of Spiral 8.2 assessment requirements (Assessment Objectives, Assessment Sub-Objectives, and Critical Assessment Conditions) to capture engineering, test, and analysis data to support S8.2 Technical Capability Declaration, and drive BMDS system test objectives and test resourcing in the BMDS Integrated Master Test Plan (IMTP).</p> <p>FY 2016 Plans: Flight Test Execution: Participate in and analyze results of flight tests in accordance with the BMDS Integrated Master Test Plan (IMTP)</p> <p>Enterprise Sensors Laboratory (ESL) and supporting activities: -Demonstrate prototype algorithms for track and measurement level sensor data fusion and feature extraction through flight tests, ground tests and real-world targets of opportunities before incorporation into formal C2BMC spiral builds. -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable assessments of track accuracy improvements resulting from incorporation of Space Based Infra-Red System (SBIRS) Geosynchronous Earth Orbit (GEO) Scanner Wideband, SBIRS GEO Starer Wideband, and other new Overhead Persistent Infra-Red (OPIR) sensor data feeds -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable effectiveness evaluations of sensor data fusion enabled through the incorporation of radio frequency data into the existing ESL Infrared three-dimension (3-D) track formulation processes. -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable characterization of the capability to extract information from observations of dim upper stages of threat systems and the ability to exploit features extracted from available sensor resource data. -Compile and provide test and demonstration results back to the algorithms development activity in Project MD01 to enable algorithm refinement</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<p>C2BMC Experimentation Lab (X-Lab):</p> <ul style="list-style-type: none"> - Demonstrate maturing C2BMC technologies and software builds through flight tests, ground tests and real-world targets of opportunity before incorporation into formal C2BMC spiral builds. -Plan, coordinate, and provide test operations utilizing maturing C2BMC technologies to produce data to enable evaluation of architecture schemas for system track data distribution and common cueing protocols across the Joint OPIR Ground (JOG), Space Based Infra-Red System (SBIRS), and Missile Defense Agency (MDA) system architectures. -Host and test Spiral 8.2 engineering releases -Compile and provide test and demonstration results back to the development activity in Project MD01 for architecture refinement activities and Spiral 8.2 performance evaluation <p>Ground Test Execution:</p> <p>Participate in and analyze results of ground tests in accordance with the BMDS Integrated Master Test Plan (IMTP)</p> <p>Enterprise Sensors Laboratory (ESL):</p> <ul style="list-style-type: none"> -Demonstrate prototype algorithms for track and measurement level sensor data fusion and feature extraction through flight tests, ground tests and real-world targets of opportunities before incorporation into formal C2BMC spiral builds. -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable assessments of track accuracy improvements resulting from incorporation of Space Based Infra-Red System (SBIRS) Geosynchronous Earth Orbit (GEO) Scanner Wideband and other new Overhead Persistent Infra-Red (OPIR) sensor data feeds -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable effectiveness evaluations of sensor data fusion enabled through the incorporation of radio frequency data into the existing ESL Infrared three-dimension track formulation processes. -Plan, coordinate, and provide test operations utilizing ESL prototypes to produce data to enable characterization of the capability to extract information from observations of dim upper stages of threat systems and the ability to exploit features extracted from available sensor resource data. -Compile and provide test and demonstration results back to the algorithms development activity in Project MD01 to enable algorithm refinement <p>C2BMC Experimentation Lab (X-Lab):</p> <ul style="list-style-type: none"> - Demonstrate maturing Command and Control, Battle Management and Communications (C2BMC) technologies and software builds through flight tests, ground tests and real-world targets of opportunities before incorporation into formal C2BMC spiral builds. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2014	FY 2015	FY 2016
<p>-Plan, coordinate, and provide test operations utilizing maturing C2BMC technologies to produce data to enable evaluation of architecture schemas for system track data distribution and common cueing protocols across the Joint OPIR Ground (JOG), Space Based Infra-Red System (SBIRS), and Missile Defense Agency (MDA) system architectures.</p> <p>-Host and test Spiral 8.2 engineering releases</p> <p>-Compile and provide test and demonstration results back to the development activity in Project MD01 for architecture refinement activities and Spiral 8.2 performance evaluation</p> <p>Resources: Participate in and analyze results of ground and flight tests, wargames, and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP)</p> <ul style="list-style-type: none"> - Plan, collect data, assess, examine, and report on Command and Control, Battle Management and Communications (C2BMC) spiral integration testing - Support interoperability and integration of the BMDS program elements - Support European Phased Adaptive Approach (EPAA) Phase 2 Situational Awareness (SA) Node deployments - Provide infrastructure, network, and troubleshooting support to: <ul style="list-style-type: none"> -- C2BMC Command Center (CCC) (Includes BMDS Network Operations and Security Center (BNOSC)) -- System Test and Operations Center (STOC) -- C2BMC System Support Center (CSSC) -- Ballistic Missile Defense System (BMDS) Communications Network (BCN) -- Distributed Multi-Echelon Distributed Training system (DMETS) Infrastructure -- Distributed Training system (DTS) - Continue C2BMC and North Atlantic Treaty Organization (NATO) planning demonstrations - Continue to support NATO live fire events - Continue development and upgrades for Cyber Testing in the C2BMC Testbed (CTB) <p>Wargames & Exercises: Participate in and analyze results of wargames and exercises in accordance with the BMDS Integrated Master Test Plan (IMTP)</p> <p>Program, Planning & Operations: - Complete definition of Key Test Points for C2BMC Model (BCM 8.2-1) Verification and Validation</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
- Allocate C2BMC Modeling and Simulation (M&S) data collection requirements of Critical Engagement Conditions (CEC) and Key Test Points (KTP) to Flight and Ground Test events			
- Perform initial development of S8.2-3 CEC and KTP for inclusion in IMTP			
Accomplishments/Planned Programs Subtotals	34.776	56.237	59.172

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

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 0603177C: <i>Discrimination Sensor Technology</i>	29.642	36.610	28.200	-	28.200	-	-	-	-	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	35.421	13.284	9.876	-	9.876	3.723	-	-	-	-	62.304
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,064.445	873.923	1,284.891	-	1,284.891	936.425	803.392	903.539	912.890	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	340.391	270.901	233.588	-	233.588	228.437	142.363	140.740	141.733	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	368.965	401.971	409.088	-	409.088	423.092	417.831	420.104	433.604	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	885.704	764.224	843.355	-	843.355	762.740	748.354	564.827	579.585	Continuing	Continuing
• 0603893C: <i>Space Tracking and Surveillance System</i>	41.618	31.331	31.632	-	31.632	17.917	23.937	28.789	30.344	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	6.412	6.389	23.289	-	23.289	21.433	16.108	11.933	11.952	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	50.271	58.503	49.211	-	49.211	58.074	53.655	55.194	57.162	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	70.336	64.409	72.866	-	72.866	71.267	75.760	72.319	87.058	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	342.695	366.302	274.323	-	274.323	298.390	345.333	330.404	350.747	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	501.170	455.068	513.256	-	513.256	585.727	484.242	442.202	460.945	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u> <u>Base</u>	<u>FY 2016</u> <u>OCO</u>	<u>FY 2016</u> <u>Total</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
Remarks											

D. Acquisition Strategy

The Command and Control, Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of 2nd quarter 2012 through 1st quarter 2017. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency **Date:** February 2015

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Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Support (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Test and Evaluation (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Master Test Plan - Enterprise Sensors Lab Infrastructure	SS/CPAF	Northrop-Grumman Corporation : Colorado Springs, CO	0.000	1.100		5.435		6.687		-		6.687	Continuing	Continuing	Continuing
Integrated Master Test Plan - Enterprise Sensors Lab Infrastructure Support	MIPR	Various : VA; OH; AL;NM; CA	0.000	4.570		1.591		2.085		-		2.085	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master Test Plan BMDS Level Testing	SS/IDIQ	Lockheed Martin Team : Arlington, VA; Huntsville, AL;Colorado Springs, CO	12.899	19.909		23.257		24.258		-		24.258	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master	SS/CPAF	Northrop-Grumman Corporation :	28.621	9.197		25.954		26.142		-		26.142	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency **Date:** February 2015

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Test and Evaluation (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Plan BMDS level Testing (Element/System Test Lab Facilities)		Colorado Springs, CO													
Subtotal			41.520	34.776		56.237		59.172		-		59.172	-	-	-

Remarks
N/A

Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks
N/A

	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	41.520	34.776	56.237	59.172	-	59.172	-	-	-

Remarks
N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency		Date: February 2015
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Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
 Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
Install Spiral 8.2 Mission Node - Ground Test	✦																											
VIGILANT SHIELD 14 Exercise Planning - 2014	▲																											
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 14- 2014	▲																											
GLOBAL LIGHTNING 14 Exercise Event - 2014	▲																											
AIR and MISSILE DEFENSE Exercise USCENTCOM Event 1 - 2014	▲																											
RAMSTEIN ALLIANCE EXERCISE - 2014	▲																											
GLOBAL THUNDER 15 Exercise Planning - 2014	▲																											
AST-14	✦																											
MISSILE DEFENSE CONFERENCE Event - 2014	▲																											
JOINT AIR DEFENSE USCENTCOM Exercise Event 1 - 2014	▲																											
ARABIAN GULF SHIELD Exercise Event 1 - 2014	▲																											
Install Spiral 8.2 Management Node - C2BMC Testbed	✦	✦																										
Install Spiral 8.2 Mission Nodes (2) - C2BMC Testbed	✦	✦																										
GTD-04e Part 2 (BMDS Ground Test)	✧	✧	✧	✧	✧	✧																						
JOINT AIR DEFENSE USCENTCOM Exercise Event 2 - 2014		▲																										
FLEET SYNTHETIC TRAINING Exercise - 2014		▲																										
ARABIAN GULF SHIELD Exercise Event 2 - 2014		▲																										
JOINT AIR DEFENSE USCENTCOM Exercise Event 3 - 2014			▲																									
JUNIPER COBRA 14 - 2014				▲																								
ARABIAN GULF SHIELD Exercise Event 3- 2014				▲																								
FTM-26 (Aegis 5.0 Intercept Flight Test)				△																								
FTX-20 (Aegis 5.0 Target Only Flight Test)				△																								
FTM-25 (Aegis 5.0 Intercept Flight Test)				△																								
Israeli Cooperative Intercept Flight Test - FY 2015					✦	✦	✦	✦																				
FTX-19 (Aegis 4.0.2 Target Only Flight Test)					△																							

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency **Date:** February 2015

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

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
FTP-09 (8-3) (LTPO Intercept Flight Test)					△																							
GTI-06 Part 2 (BMDS Ground Test)						✦																						
FTG-09 (GM Intercept Flight Test)						△																						
GTI-06 Part 1 (BMDS Ground Test)						✦																						
GDEx 06 Part 2 (BMDS Ground Test)						✦																						
FTP-10 (8-4) (LTPO Intercept Flight Test)						△																						
FTO-02 E1 (OTA Intercept Flight Test)						△																						
SCD CTV-01 (AEGIS SCD Intercept Only Flight Test)						△																						
FTO-02 E2 (OTA Intercept Flight Test)							△																					
FTT-18 (TH Intercept Flight Test)							△																					
VIGILANT SHIELD 16 Exercise Event - 2016								△																				
AIR and MISSILE DEFENSE Exercise Series - 2016								△																				
GLOBAL THUNDER 16 Exercise Event - 2016								△																				
EPOCH PLANEX Exercise - 17								△																				
ARABIAN GULF SHIELD 16 Exercise Event 1 - 2016								△																				
GM CTV-02+ (GM Flight Test)								△																				
KEY RESOLVE 16 Exercise - 2016									△																			
FLEET SYNTHETIC TRAINING Exercise - 2016									△																			
ARABIAN GULF SHIELD 16 Exercise Event 2 - 2016									△																			
GLOBAL LIGHTNING 16 Exercise Event - 2016										✦	✦																	
JUNIPER COBRA 16 Exercise - 2016										✦	✦																	
TERMINAL FURY 16 Exercise - 2016										✦	✦																	
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 16 - 2016											△																	
SFTM-01 E2 (AEGIS 5.1 Intercept Flight Test)											✦																	
GTI-ISR (BMDS Ground Test)											✦																	
ULCHI FREEDOM GUARD 16 Event - 2016											✦	✦																
BMDS Wargame 2017 Event - 2017											✦	✦	✦	✦														
JOINT AIR DEFENSE Exercise Series - 2016												△																
EAGLE RESOLVE 16 Exercise Event - 2016													△															

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Significant Event Complete Milestone Decision Complete Element Test Complete System Level Test Complete Complete Activity
 Significant Event Planned Milestone Decision Planned Element Test Planned System Level Test Planned Planned Activity

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
ARABIAN GULF SHIELD 16 Exercise Event 3 - 2016																												
GTD-06 Part 2 (BMDS Ground Test)																												
FTG-15 (GM Intercept Flight Test)																												
RAMSTEIN ALLIANCE Exercise - 2016																												
NIMBLE TITAN 18 Wargame Year 1 - 18																												
VIGILANT SHIELD 17 Exercise Event - 2017																												
AIR and MISSILE DEFENSE Exercise Series - 2017																												
EPOCH PLANEX Exercise - 18																												
ARABIAN GULF SHIELD 17 Exercise Event 1 - 2017																												
FTM-27 (AEGIS SBT Intercept Flight Test)																												
SFTM-02 (AEGIS 5.1 Intercept Flight Test)																												
GLOBAL RESPONSE Exercise Event - 2016																												
GLOBAL THUNDER 17 Exercise Event - 2017																												
AUSTERE CHALLENGE 17 Exercise - 2017																												
Israeli Cooperative Intercept Flight Test - FY 2017																												
KEY RESOLVE 17 Exercise - 2017																												
FLEET SYNTHETIC TRAINING Exercise - 2017																												
ARABIAN GULF SHIELD 17 Exercise Event 2 - 2017																												
GTI-07a (BMDS Ground Test)																												
FTT-15 (TH Intercept Flight Test)																												
GLOBAL LIGHTNING 17 Exercise Event - 2017																												
TERMINAL FURY 17 Exercise - 2017																												
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 17 - 2017																												
FTX-22 (SN Target Only Flight Test)																												
GTD-07a Part 1 (BMDS Ground Test)																												
ULCHI FREEDOM GUARDIAN 17 Event - 2017																												
GTD-07a Part 2 (BMDS Ground Test)																												
KEEN SWORD 17 Exercise - 2017																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency **Date:** February 2015

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

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
Spiral 8.2-1 NORTHCOM/PACOM Capability Declaration															△													
JOINT AIR DEFENSE Exercise Series - 2017															△													
ARABIAN GULF SHIELD 17 Exercise Event 3 - 2017															△													
FTG-11 (GM Salvo Intercept Flight Test)															△													
RAMSTEIN ALLIANCE Exercise - 2017															✦	✦												
KEEN EDGE 18 Exercise Event - 2018															✦	✦	✦											
NIMBLE TITAN 18 Wargame Event 2 - 2018															✦	✦	✦	✦										
AIR and MISSILE DEFENSE Exercise Series - 2018															△													
GLOBAL THUNDER 18 Exercise Event - 2018															△													
VIGILANT SHIELD 18 Exercise Event - 2018															△													
EPOCH PLANEX Exercise - 19															△													
ARABIAN GULF SHIELD 18 Exercise Event 1 - 2018															△													
FTM-29 (AEGIS 5.1 Intercept Flight Test)															△													
GTX-07b (BMDS Ground Test)															✦													
EAGLE RESOLVE 18 Exercise Event - 2018																△												
KEY RESOLVE 18 Exercise - 2018																△												
FLEET SYNTHETIC TRAINING Exercise - 2018																△												
ARABIAN GULF SHIELD 18 Exercise Event 2 - 2018																△												
FTM-31 (AEGIS SBT Intercept Flight Test)																△												
FTM-33 (AEGIS SBT Intercept Flight Test)																△												
GLOBAL RESPONSE (GREx) Exercise Event - 2018																△												
GLOBAL LIGHTNING 18 Exercise Event - 2018																✦	✦											
JUNIPER COBRA 18 Exercise - 2018																✦	✦											
TERMINAL FURY 18 Exercise - 2018																✦	✦											
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 18 - 2018																	△											
FTO-03 E1 (OTA Intercept Flight Test)																△												
ULCHI FREEDOM GUARDIAN 18 Event - 2018																✦	✦											
GTI-07b (BMDS Ground Test)																✦	✦											
JOINT AIR DEFENSE Exercise Series- 2018																	△											

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency **Date:** February 2015

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

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
ARABIAN GULF SHIELD 18 Exercise Event 3 - 2018																			△									
FTM-32 (AEGIS SBT Intercept Flight Test)																			△									
GTD-07b Part 2 (BMDS Ground Test)																			✦									
FTO-03 E2 (OTA Intercept Flight Test)																			△									
RAMSTEIN ALLIANCE Exercise - 2018																			✦	✦								
BMDS WARGAME 2019 Event - 2019																			✦	✦	✦							
NIMBLE TITAN 20 Wargame Event 1 - 2020																			✦	✦	✦	✦						
Spiral 8.2-1/Spiral 8.2-3 CENTCOM Capability Declaration																				△								
Spiral 8.2-1/Spiral 8.2-3 EUCOM Capability Declaration																				△								
AIR and MISSILE DEFENSE Exercise Series- 2019																				△								
GLOBAL THUNDER 19 Exercise Event - 2019																				△								
VIGILANT SHIELD 19 Exercise Event - 2019																				△								
EPOCH PLANEX Exercise - 20																				△								
ARABIAN GULF SHIELD 19 Exercise Event 1 - 2019																				△								
GTD-07b Part 1 (BMDS Ground Test)																				✦								
EPOCH PLANEX Exercise - 21																				✦	✦	✦	✦	✦				
KEY RESOLVE 19 Exercise - 2019																					△							
FLEET SYNTHETIC TRAINING Exercise - 2019																					△							
ARABIAN GULF SHIELD 19 Exercise Event 2 - 2019																					△							
GLOBAL LIGHTNING 19 Exercise Event - 2019																					✦	✦						
TERMINAL FURY 19 Exercise - 2019																					✦	✦						
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 19 - 2019																						△						
FTG-17 (GM Intercept Flight Test)																						△						
GTX-08 Part 1 (BMDS Ground Test)																						✦						
Spiral 8.2-3 NORTHCOM/PACOM Installation																						△						
ULCHI FREEDOM GUARD 19 Event - 2019																						✦	✦					
KEEN SWORD 19 Exercise - 2019																						✦	✦	✦				
KEEN EDGE 20 Exercise Event - 2020																						✦	✦	✦	✦			

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency **Date:** February 2015

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

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
EAGLE RESOLVE 19 Exercise Event - 2019																												
FTM-35 (AEGIS 5.1 Intercept Flight Test)																												
FTT-19 (TH Intercept Flight Test)																												
FTX-23 (AEGIS 5.1 Target Only Flight Test)																												
GTX-08 Part 2(BMDS Ground Test)																												
ARABIAN GULF SHIELD 19 Exercise Event 3 - 2019																												
RAMSTEIN ALLIANCE Exercise - 2019																												
NIMBLE TITAN 20 Wargame Event 2- 2020																												
AIR and MISSILE DEFENSE Exercise Series - 2020																												
GLOBAL THUNDER 20 Exercise Event - 2020																												
VIGILANT SHIELD 20 Exercise Event - 2020																												
ARABIAN GULF SHIELD 20 Exercise Event 1 - 2020																												
KEY RESOLVE 20 Exercise - 2020																												
FLEET SYNTHETIC TRAINING Exercise - 2020																												
ARABIAN GULF SHIELD 20 Exercise Event 2 - 2020																												
GLOBAL RESPONSE Exercise Event - 2020																												
GLOBAL LIGHTNING 20 Exercise Event - 2020																												
TERMINAL FURY 20 Exercise - 2020																												
EAGLE RESOLVE 21 Exercise Event - 2020																												
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 20- 2020																												
JUNIPER COBRA 20 Exercise - 2020																												
FTO-04 (OTA Intercept Flight Test)																												
FTX-26 (SN Target Only Flight Test)																												
KEEN SWORD 21 Exercise - 2021																												
ULCHI FREEDOM GUARDIAN 20 Event - 2020																												
ARABIAN GULF SHIELD 20 Exercise Event 3 - 2020																												
FTM-30 (AEGIS 5.1 Intercept Flight Test)																												
FTT-16 (TH Intercept Flight Test)																												
GTD-08 Part 1 (BMDS Ground Test)																												

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

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020																			
	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	3	4																
RAMSTEIN ALLIANCE Exercise - 2020																																												
BMDS WARGAME 2021 Event - 2021																																												
NIMBLE TITAN 21 Wargame Event 1 - 2021																																												
NIMBLE TITAN 21 Wargame Event 2 - 2021																																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Missile Defense Agency		Date: February 2015
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Install Spiral 8.2 Mission Node - Ground Test	1	2014	1	2014
VIGILANT SHIELD 14 Exercise Planning - 2014	1	2014	1	2014
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 14- 2014	1	2014	1	2014
GLOBAL LIGHTNING 14 Exercise Event - 2014	1	2014	1	2014
AIR and MISSILE DEFENSE Exercise USCENTCOM Event 1 - 2014	1	2014	1	2014
RAMSTEIN ALLIANCE EXERCISE - 2014	1	2014	1	2014
GLOBAL THUNDER 15 Exercise Planning - 2014	1	2014	1	2014
AST-14	1	2014	1	2014
MISSILE DEFENSE CONFERENCE Event - 2014	1	2014	1	2014
JOINT AIR DEFENSE USCENTCOM Exercise Event 1 - 2014	1	2014	1	2014
ARABIAN GULF SHIELD Exercise Event 1 - 2014	1	2014	1	2014
Install Spiral 8.2 Element and User Gateway Nodes (5) - C2BMC Testbed	1	2014	2	2014
Install Spiral 8.2 Management Node - C2BMC Testbed	1	2014	2	2014
Install Spiral 8.2 Mission Nodes (2) - C2BMC Testbed	1	2014	2	2014
GTD-04e Part 2 (BMDS Ground Test)	1	2014	2	2015
JOINT AIR DEFENSE USCENTCOM Exercise Event 2 - 2014	2	2014	2	2014
FLEET SYNTHETIC TRAINING Exercise - 2014	2	2014	2	2014
ARABIAN GULF SHIELD Exercise Event 2 - 2014	2	2014	2	2014
JOINT AIR DEFENSE USCENTCOM Exercise Event 3 - 2014	3	2014	3	2014
JUNIPER COBRA 14 - 2014	4	2014	4	2014
ARABIAN GULF SHIELD Exercise Event 3- 2014	4	2014	4	2014

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Missile Defense Agency **Date:** February 2015

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Events	Start		End	
	Quarter	Year	Quarter	Year
FTM-26 (Aegis 5.0 Intercept Flight Test)	1	2015	1	2015
FTX-20 (Aegis 5.0 Target Only Flight Test)	1	2015	1	2015
FTM-25 (Aegis 5.0 Intercept Flight Test)	1	2015	1	2015
Israeli Cooperative Intercept Flight Test - FY 2015	1	2015	4	2015
FTX-19 (Aegis 4.0.2 Target Only Flight Test)	2	2015	2	2015
FTP-09 (8-3) (LTPO Intercept Flight Test)	2	2015	2	2015
GTI-06 Part 2 (BMDS Ground Test)	3	2015	3	2015
FTG-09 (GM Intercept Flight Test)	3	2015	3	2015
GTI-06 Part 1 (BMDS Ground Test)	3	2015	3	2015
GDEx 06 Part 2 (BMDS Ground Test)	3	2015	3	2015
FTP-10 (8-4) (LTPO Intercept Flight Test)	3	2015	3	2015
FTO-02 E1 (OTA Intercept Flight Test)	3	2015	3	2015
SCD CTV-01 (AEGIS SCD Intercept Only Flight Test)	3	2015	3	2015
FTO-02 E2 (OTA Intercept Flight Test)	4	2015	4	2015
FTT-18 (TH Intercept Flight Test)	4	2015	4	2015
VIGILANT SHIELD 16 Exercise Event - 2016	1	2016	1	2016
AIR and MISSILE DEFENSE Exercise Series - 2016	1	2016	1	2016
GLOBAL THUNDER 16 Exercise Event - 2016	1	2016	1	2016
EPOCH PLANEX Exercise - 17	1	2016	1	2016
ARABIAN GULF SHIELD 16 Exercise Event 1 - 2016	1	2016	1	2016
GM CTV-02+ (GM Flight Test)	1	2016	1	2016
KEY RESOLVE 16 Exercise - 2016	2	2016	2	2016
FLEET SYNTHETIC TRAINING Exercise - 2016	2	2016	2	2016
ARABIAN GULF SHIELD 16 Exercise Event 2- 2016	2	2016	2	2016
GLOBAL LIGHTNING 16 Exercise Event - 2016	2	2016	3	2016

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Missile Defense Agency **Date:** February 2015

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Events	Start		End	
	Quarter	Year	Quarter	Year
JUNIPER COBRA 16 Exercise - 2016	2	2016	3	2016
TERMINAL FURY 16 Exercise - 2016	2	2016	3	2016
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 16 - 2016	3	2016	3	2016
SFTM-01 E2 (AEGIS 5.1 Intercept Flight Test)	3	2016	3	2016
GTI-ISR (BMDS Ground Test)	3	2016	3	2016
ULCHI FREEDOM GUARD 16 Event - 2016	3	2016	4	2016
BMDS Wargame 2017 Event - 2017	3	2016	2	2017
JOINT AIR DEFENSE Exercise Series - 2016	4	2016	4	2016
EAGLE RESOLVE 16 Exercise Event - 2016	4	2016	4	2016
ARABIAN GULF SHIELD 16 Exercise Event 3 - 2016	4	2016	4	2016
GTD-06 Part 2 (BMDS Ground Test)	4	2016	4	2016
FTG-15 (GM Intercept Flight Test)	4	2016	4	2016
RAMSTEIN ALLIANCE Exercise - 2016	4	2016	1	2017
NIMBLE TITAN 18 Wargame Year 1 - 18	4	2016	3	2017
VIGILANT SHIELD 17 Exercise Event - 2017	1	2017	1	2017
AIR and MISSILE DEFENSE Exercise Series - 2017	1	2017	1	2017
EPOCH PLANEX Exercise - 18	1	2017	1	2017
ARABIAN GULF SHIELD 17 Exercise Event 1 - 2017	1	2017	1	2017
FTM-27 (AEGIS SBT Intercept Flight Test)	1	2017	1	2017
SFTM-02 (AEGIS 5.1 Intercept Flight Test)	1	2017	1	2017
GLOBAL RESPONSE Exercise Event - 2016	1	2017	1	2017
GLOBAL THUNDER 17 Exercise Event - 2017	1	2017	1	2017
AUSTERE CHALLENGE 17 Exercise - 2017	1	2017	4	2017
Israeli Cooperative Intercept Flight Test - FY 2017	1	2017	4	2017
KEY RESOLVE 17 Exercise - 2017	2	2017	2	2017

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Missile Defense Agency **Date:** February 2015

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Events	Start		End	
	Quarter	Year	Quarter	Year
FLEET SYNTHETIC TRAINING Exercise - 2017	2	2017	2	2017
ARABIAN GULF SHIELD 17 Exercise Event 2 - 2017	2	2017	2	2017
GTI-07a (BMDS Ground Test)	2	2017	2	2017
FTT-15 (TH Intercept Flight Test)	2	2017	2	2017
GLOBAL LIGHTNING 17 Exercise Event - 2017	2	2017	3	2017
TERMINAL FURY 17 Exercise - 2017	2	2017	3	2017
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 17 - 2017	3	2017	3	2017
FTX-22 (SN Target Only Flight Test)	3	2017	3	2017
GTD-07a Part 1 (BMDS Ground Test)	3	2017	3	2017
ULCHI FREEDOM GUARDIAN 17 Event - 2017	3	2017	4	2017
GTD-07a Part 2 (BMDS Ground Test)	3	2017	4	2017
KEEN SWORD 17 Exercise - 2017	3	2017	1	2018
Spiral 8.2-1 NORTHCOM/PACOM Capability Declaration	4	2017	4	2017
JOINT AIR DEFENSE Exercise Series - 2017	4	2017	4	2017
ARABIAN GULF SHIELD 17 Exercise Event 3 - 2017	4	2017	4	2017
FTG-11 (GM Salvo Intercept Flight Test)	4	2017	4	2017
RAMSTEIN ALLIANCE Exercise - 2017	4	2017	1	2018
KEEN EDGE 18 Exercise Event - 2018	4	2017	2	2018
NIMBLE TITAN 18 Wargame Event 2 - 2018	4	2017	3	2018
AIR and MISSILE DEFENSE Exercise Series - 2018	1	2018	1	2018
GLOBAL THUNDER 18 Exercise Event - 2018	1	2018	1	2018
VIGILANT SHIELD 18 Exercise Event - 2018	1	2018	1	2018
EPOCH PLANEX Exercise - 19	1	2018	1	2018
ARABIAN GULF SHIELD 18 Exercise Event 1 - 2018	1	2018	1	2018
FTM-29 (AEGIS 5.1 Intercept Flight Test)	1	2018	1	2018

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Events	Start		End	
	Quarter	Year	Quarter	Year
GTX-07b (BMDS Ground Test)	1	2018	1	2018
EAGLE RESOLVE 18 Exercise Event - 2018	2	2018	2	2018
KEY RESOLVE 18 Exercise - 2018	2	2018	2	2018
FLEET SYNTHETIC TRAINING Exercise - 2018	2	2018	2	2018
ARABIAN GULF SHIELD 18 Exercise Event 2 - 2018	2	2018	2	2018
FTM-31 (AEGIS SBT Intercept Flight Test)	2	2018	2	2018
FTM-33 (AEGIS SBT Intercept Flight Test)	2	2018	2	2018
GLOBAL RESPONSE (GREx) Exercise Event - 2018	2	2018	2	2018
GLOBAL LIGHTNING 18 Exercise Event - 2018	2	2018	3	2018
JUNIPER COBRA 18 Exercise - 2018	2	2018	3	2018
TERMINAL FURY 18 Exercise - 2018	2	2018	3	2018
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 18 - 2018	3	2018	3	2018
FTO-03 E1 (OTA Intercept Flight Test)	3	2018	3	2018
ULCHI FREEDOM GUARDIAN 18 Event - 2018	3	2018	4	2018
GTI-07b (BMDS Ground Test)	3	2018	4	2018
JOINT AIR DEFENSE Exercise Series- 2018	4	2018	4	2018
ARABIAN GULF SHIELD 18 Exercise Event 3 - 2018	4	2018	4	2018
FTM-32 (AEGIS SBT Intercept Flight Test)	4	2018	4	2018
GTD-07b Part 2 (BMDS Ground Test)	4	2018	4	2018
FTO-03 E2 (OTA Intercept Flight Test)	4	2018	4	2018
RAMSTEIN ALLIANCE Exercise - 2018	4	2018	1	2019
BMDS WARGAME 2019 Event - 2019	4	2018	2	2019
NIMBLE TITAN 20 Wargame Event 1 - 2020	4	2018	3	2019
Spiral 8.2-1/Spiral 8.2-3 CENTCOM Capability Declaration	1	2019	1	2019
Spiral 8.2-1/Spiral 8.2-3 EUCOM Capability Declaration	1	2019	1	2019

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Events	Start		End	
	Quarter	Year	Quarter	Year
AIR and MISSILE DEFENSE Exercise Series- 2019	1	2019	1	2019
GLOBAL THUNDER 19 Exercise Event - 2019	1	2019	1	2019
VIGILANT SHIELD 19 Exercise Event - 2019	1	2019	1	2019
EPOCH PLANEX Exercise - 20	1	2019	1	2019
ARABIAN GULF SHIELD 19 Exercise Event 1 - 2019	1	2019	1	2019
GTD-07b Part 1 (BMDS Ground Test)	1	2019	1	2019
EPOCH PLANEX Exercise - 21	1	2019	1	2020
KEY RESOLVE 19 Exercise - 2019	2	2019	2	2019
FLEET SYNTHETIC TRAINING Exercise - 2019	2	2019	2	2019
ARABIAN GULF SHIELD 19 Exercise Event 2 - 2019	2	2019	2	2019
GLOBAL LIGHTNING 19 Exercise Event - 2019	2	2019	3	2019
TERMINAL FURY 19 Exercise - 2019	2	2019	3	2019
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 19 - 2019	3	2019	3	2019
FTG-17 (GM Intercept Flight Test)	3	2019	3	2019
GTX-08 Part 1 (BMDS Ground Test)	3	2019	3	2019
Spiral 8.2-3 NORTHCOM/PACOM Installation	3	2019	3	2019
ULCHI FREEDOM GUARD 19 Event - 2019	3	2019	4	2019
KEEN SWORD 19 Exercise - 2019	3	2019	1	2020
KEEN EDGE 20 Exercise Event - 2020	3	2019	2	2020
EAGLE RESOLVE 19 Exercise Event - 2019	4	2019	4	2019
FTM-35 (AEGIS 5.1 Intercept Flight Test)	4	2019	4	2019
FTT-19 (TH Intercept Flight Test)	4	2019	4	2019
FTX-23 (AEGIS 5.1 Target Only Flight Test)	4	2019	4	2019
GTX-08 Part 2(BMDS Ground Test)	4	2019	4	2019
ARABIAN GULF SHIELD 19 Exercise Event 3 - 2019	4	2019	4	2019

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Events	Start		End	
	Quarter	Year	Quarter	Year
RAMSTEIN ALLIANCE Exercise - 2019	4	2019	1	2020
NIMBLE TITAN 20 Wargame Event 2- 2020	4	2019	3	2020
AIR and MISSILE DEFENSE Exercise Series - 2020	1	2020	1	2020
GLOBAL THUNDER 20 Exercise Event - 2020	1	2020	1	2020
VIGILANT SHIELD 20 Exercise Event - 2020	1	2020	1	2020
ARABIAN GULF SHIELD 20 Exercise Event 1 - 2020	1	2020	1	2020
KEY RESOLVE 20 Exercise - 2020	2	2020	2	2020
FLEET SYNTHETIC TRAINING Exercise - 2020	2	2020	2	2020
ARABIAN GULF SHIELD 20 Exercise Event 2 - 2020	2	2020	2	2020
GLOBAL RESPONSE Exercise Event - 2020	2	2020	2	2020
GLOBAL LIGHTNING 20 Exercise Event - 2020	2	2020	3	2020
TERMINAL FURY 20 Exercise - 2020	2	2020	3	2020
EAGLE RESOLVE 21 Exercise Event - 2020	2	2020	2	2021
EUROPEAN AIR and MISSILE DEFENSE Exercise Alliance 20- 2020	3	2020	3	2020
JUNIPER COBRA 20 Exercise - 2020	3	2020	3	2020
FTO-04 (OTA Intercept Flight Test)	3	2020	3	2020
FTX-26 (SN Target Only Flight Test)	3	2020	3	2020
KEEN SWORD 21 Exercise - 2021	3	2020	2	2021
ULCHI FREEDOM GUARDIAN 20 Event - 2020	4	2020	4	2020
ARABIAN GULF SHIELD 20 Exercise Event 3 - 2020	4	2020	4	2020
FTM-30 (AEGIS 5.1 Intercept Flight Test)	4	2020	4	2020
FTT-16 (TH Intercept Flight Test)	4	2020	4	2020
GTD-08 Part 1 (BMDS Ground Test)	4	2020	4	2020
RAMSTEIN ALLIANCE Exercise - 2020	4	2020	1	2021
BMDS WARGAME 2021 Event - 2021	4	2020	2	2021

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Events	Start		End	
	Quarter	Year	Quarter	Year
NIMBLE TITAN 21 Wargame Event 1 - 2021	4	2020	3	2021
NIMBLE TITAN 21 Wargame Event 2 - 2021	4	2020	3	2021

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COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>	124.092	91.287	91.111	93.097	-	93.097	99.606	95.659	95.979	99.632	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

OPERATIONS AND SUSTAINMENT

Command and Control, Battle Management and Communications (C2BMC) Program Operations and Sustainment (O&S) consists of 1) sustaining C2BMC operational capability worldwide; 2) on-site sub-systems maintenance for all C2BMC including Combatant Commanders (COCOM) suites, Global Engagement Manager (GEM) suites, planners, remote Enterprise Work Stations (EWS), and GEM Work Stations (GWS), web browsers, and communication site(s) associated with the Army Navy/ Ground Transportable Radar Surveillance model 2 (AN/TPY-2) radar(s); 3) the C2BMC Control Center that provides real-time resolution of operational issues; 4) vendor support which includes coordination and resolution of problems that occur with Commercial-off-the-Shelf (COTS) equipment; 5) training of operator, maintenance personnel, and testers (approximately 700 per year); 6) hardware and software maintenance and upgrade installation to ensure continuity of C2BMC operations.

On-site support provides:

- Assistance to the System Administrator of each Combatant Command (COCOM)
- Prime contractor support to operational users
- Maintenance of hardware and software
- Security support for the C2BMC equipment, hardware and software and auxiliary communication capabilities 24 hours a day, 7 days a week, 365 days a year through network and equipment operations monitoring
- Support to operators and testers during test, exercises, and wargames

Off-site support provides:

- Integrated logistics support planning and management
- Hardware and software maintenance and logistics functions that are beyond the capability of on-site support personnel
- Inventory and spares management
- Sustaining engineering support from the prime contractor and government activities

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency	Date: February 2015
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- Maintenance of software licenses and vendor support agreements
- Hardware and software maintenance agreements
- Vendor depot support services
- C2BMC Control Center (CCC) (help desk) in Colorado Springs, CO provides:
 - Real-time resolution of operational issues
 - The schedule for maintenance, systems upgrades, tests, exercises, and wargames, coordinated across all users
 - Collection of data regarding system/sub-system failures and prioritization of corrective actions
 - Review of hardware/software problems and coordination of Commercial-Off-the-Shelf (COTS) developer/vendor service calls

Training support includes:

- Developing and maintaining operator, maintenance personnel, and testers training material for C2BMC components/capabilities
- Training tailored to each deployment and/or test
- Training curriculum/courses provided for Ballistic Missile Defense (BMD) Planner, Situational Awareness, Global Engagement Manager (GEM), and the C2BMC Executive Course
- Warfighter sustainment training and skill proficiency
- Assistance to warfighter in development and execution of the Radar Management Course
- New equipment training to end-users and training organizations

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

	FY 2014	FY 2015	FY 2016
<p>Title: Operations and Support</p> <p align="right">Articles:</p> <p>Description: N/A</p> <p>FY 2014 Accomplishments:</p> <ul style="list-style-type: none"> - Maintained C2BMC training suites - Sustained Global Engagement Manager (GEM) trainers - Developed curriculum for and trained operators, maintenance personnel, and testers - Resolved real-time operational issues through the C2BMC Control Center (CCC) (includes Ballistic Missile Defense System (BMDS) Network Operation and Security Center (BNOSC)) - Provided and supported communications circuits for fielded C2BMC locations - Provided integrated logistics support planning and management and sustaining engineering support for fielded hardware and software, including support to Navy Maritime Operations Centers where C2BMC equipment resides - Provided operations support of Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) radar communications nodes 	69.763	70.018	71.192
	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

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

	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Provided operations and sustainment personnel to support test and special operations for AN/TPY-2 at 5 deployed operational and test sites - Supported Host Nation operations, demonstrations, and tests - Provided sustainment training/skills proficiency to C2BMC operators - Upgraded and maintained computer network defense and network monitoring in the CCC (including the BNOSC) - Operated the CCC (including the BNOSC) 24 hours a day, 7 days a week, 365 days a year - Provided sustainment of the BCN Teleport Gateway (BTG) at the DoD teleports: Lago Patria, IT; Ramstein, DE; Fort Buckner, JP; Camp Roberts, CA; Wahiawa, HI; Northwest, VA - Supported the installation and integration of the second Modernization of Enterprise Terminal (MET) in EUCOM - Continued round-the-clock sustainment for Communications capabilities with Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) - Continued on-site C2BMC support of fielded sites for hardware and software - Continued C2BMC operator training for fielded capabilities - Continued sustaining engineering support and integrated logistics support for fielded hardware and software - Planned, engineered, deployed, and sustained C2BMC Deployable Interface Node (CDIN) (and all other required network communications equipment, and shelters) to support the deployment of an AN/TPY-02 Radar to the second site in PACOM <p>FY 2015 Plans:</p> <ul style="list-style-type: none"> Maintain C2BMC training suites - Sustain Global Engagement Manager (GEM) trainers - Develop curriculum for and train operators, maintenance personnel, and testers - Resolve real-time operational issues through the C2BMC Control Center (CCC) (includes Ballistic Missile Defense System (BMDS) Network Operation and Security Center (BNOSC)) - Provide global BMDS communications via leased Defense Information Systems Agency (DISA) circuit lines - Provide and support communications circuits for fielded C2BMC locations - Provide integrated logistics support planning and management and sustaining engineering support for fielded hardware and software, including support to Navy Maritime Operations Centers where C2BMC equipment resides - Provide operations support of Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) radar communications nodes - Provide operations and sustainment personnel to support test and special operations for AN/TPY-2 at 6 deployed operational and test sites - Support Host Nation operations, demonstrations, and tests - Provide sustainment training/skills proficiency to C2BMC operators 			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Upgrade and maintain computer network defense and network monitoring in the CCC (including the BNOSC) - Operate the CCC (including the BNOSC) 24 hours a day, 7 days a week, 365 days a year - Provide sustainment of the BCN Teleport Gateway (BTG) at the DoD teleports: Lago Patria, IT; Ramstein, GE; Fort Buckner, JP; Camp Roberts, CA; Wahiawa, HI; Northwest, VA - Support the installation and integration of the second Modernization of Enterprise Terminal (MET) in EUCOM - Continue round-the-clock sustainment for Communications capabilities with Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) - 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 fielded hardware and software - Provide engineering support to the SBIRS Increment 2 interface to ensure continued communications between the BMDS and GMD <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> -Maintain C2BMC training suites - Sustain Global Engagement Manager (GEM) trainers - Develop curriculum for and train operators, maintenance personnel, and testers - Resolve real-time operational issues through the C2BMC Control Center (CCC) (includes Ballistic Missile Defense System (BMDS) Network Operation and Security Center (BNOSC)) - Provide global BMDS communications via leased Defense Information Systems Agency (DISA) circuit lines - Provide and support communications circuits for fielded C2BMC locations - Provide integrated logistics support planning and management and sustaining engineering support for fielded hardware and software, including support to Navy Maritime Operations Centers where C2BMC equipment resides - Provide operations support of Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) radar communications nodes - Provide operations and sustainment personnel to support test and special operations for AN/TPY-2 at deployed operational and test sites - Support Host Nation operations, demonstrations, and tests - Provide sustainment training/skills proficiency to C2BMC operators - Upgrade and maintain computer network defense and network monitoring in the CCC (including the BNOSC) - Operate the CCC (including the BNOSC) 24 hours a day, 7 days a week, 365 days a year - Provide sustainment of the BCN Teleport Gateway (BTG) at the DoD teleports: Lago Patria, IT; Ramstein, GE; Fort Buckner, JP; Camp Roberts, CA; Wahiawa, HI; Northwest, VA 			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Support the installation and integration of the second Modernization of Enterprise Terminal (MET) in European Command (EUCOM) - Continue round-the-clock sustainment for Communications capabilities with Army Navy/Ground Transportable Radar Surveillance model 2 (AN/TPY-2) - 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 fielded hardware and software - Provide engineering support to the SBIRS Increment 2 interface to ensure continued communications between the Ballistic Missile Defense System (BMDS) and Ground Based Midcourse Defense (GMD) - Sustain required monthly cyber security scans and mitigation requirements 			
<p>Title: Concurrent, Test, Training, and Operations (CTTO)</p> <p align="right">Articles:</p>	21.524	21.093	21.905
<p>Description: N/A</p> <p>FY 2014 Accomplishments:</p> <ul style="list-style-type: none"> - Operated and Sustained C2BMC Spiral 6.4 Tri-Node (Tri-Node includes PACOM, NORTHCOM, and STRATCOM) Distributed Training System (DTS) system. Distributed Training System Tri-Node was formerly known as the Distributed Multi-Echelon Training System (DMETS). - Operated and Sustained C2BMC Spiral 6.4 EUCOM and CENTCOM Distributed Training System (DTS) - Deployed C2BMC Spiral 6.4 Training Support System (TSS) to Space Missile Defense Command, C2BMC Sensor Manager Training Facility and to Strategic Command (STRATCOM) - Sustained Spiral 6.4 TSS for Space Missile Defense Command, C2BMC Sensor Manager Training Facility and STRATCOM - Continued providing BMD training events across the Unified Combatant Commands while maintaining the existing architecture - Monitored and coordinated the execution of Agency Modeling and Simulation development efforts; key dependencies for the successful execution of CTTO - Continued development of C2BMC Spiral 8.2 Training Systems <p>FY 2015 Plans:</p> <ul style="list-style-type: none"> - Sustain deployed C2BMC Spiral 6.4 Training Support System (TSS). - Operate and Sustain C2BMC Spiral 6.4 Tri-Node (Tri-Node includes PACOM, NORTHCOM, and STRATCOM) Distributed Training System (DTS) system. Distributed Training System Tri-Node was formerly known as the Distributed Multi-Echelon Training System (DMETS). - Operate and Sustain C2BMC Spiral 6.4 EUCOM and CENTCOM Distributed Training System (DTS). 	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
<ul style="list-style-type: none"> - Continue providing BMD training events across the Unified Combatant Commands while maintaining the existing architecture. - Monitor and coordinate the execution of Agency Modeling and Simulation development efforts; key dependencies for the successful execution of CTTO. - Development of C2BMC Spiral 8.2 Training Systems. <p>FY 2016 Plans:</p> <ul style="list-style-type: none"> - Sustain deployed C2BMC Spiral 6.4 Training Support System (TSS) - Operate and Sustain C2BMC Spiral 6.4 Tri-Node (Tri-Node includes PACOM, NORTHCOM, and STRATCOM) Distributed Training System (DTS) system. Distributed Training System Tri-Node was formerly known as the Distributed Multi-Echelon Training System (DMETS). - Operate and Sustain C2BMC Spiral 6.4 European Command (EUCOM) and Central Command (CENTCOM) Distributed Training System (DTS) - Continue providing BMD training events across the Unified Combatant Commands while maintaining the existing architecture - Development of C2BMC Spiral 8.2 Training Systems 			
Accomplishments/Planned Programs Subtotals	91.287	91.111	93.097

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 0603177C: <i>Discrimination Sensor Technology</i>	29.642	36.610	28.200	-	28.200	-	-	-	-	Continuing	Continuing
• 0603179C: <i>Advanced C4ISR</i>	35.421	13.284	9.876	-	9.876	3.723	-	-	-	-	62.304
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	251.899	163.892	228.021	-	228.021	230.306	257.014	218.533	247.707	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,064.445	873.923	1,284.891	-	1,284.891	936.425	803.392	903.539	912.890	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	340.391	270.901	233.588	-	233.588	228.437	142.363	140.740	141.733	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	368.965	401.971	409.088	-	409.088	423.092	417.831	420.104	433.604	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	885.704	764.224	843.355	-	843.355	762.740	748.354	564.827	579.585	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 0603893C: <i>Space Tracking and Surveillance System</i>	41.618	31.331	31.632	-	31.632	17.917	23.937	28.789	30.344	Continuing	Continuing
• 0603895C: <i>Ballistic Missile Defense System Space Programs</i>	6.412	6.389	23.289	-	23.289	21.433	16.108	11.933	11.952	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	50.271	58.503	49.211	-	49.211	58.074	53.655	55.194	57.162	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	70.336	64.409	72.866	-	72.866	71.267	75.760	72.319	87.058	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	342.695	366.302	274.323	-	274.323	298.390	345.333	330.404	350.747	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	501.170	455.068	513.256	-	513.256	585.727	484.242	442.202	460.945	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Command and Control, Battle Management and Communications (C2BMC) acquisition strategy is consistent with the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, incremental development, evolutionary acquisition, and knowledge-based funding. Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transaction Agreement contract vehicle, which ended 1st quarter FY 2012. A sole source C2BMC follow-on contract to Lockheed Martin for Spiral Development, Operation and Sustainment, and Testing was awarded 1st quarter FY 2012 for an ordering period of 2nd quarter 2012 through 1st quarter 2017. Major team members to Lockheed are Northrop-Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, and operations and sustainment support of the C2BMC system. They perform development and testing of C2BMC products in Arlington, VA; Huntsville, AL; and Colorado Springs, CO; and provide worldwide on-site operations and maintenance support. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency											Date: February 2015				
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>						

Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operations and Support - Indirect Support	MIPR	DISA DECC/DISA TECC : Various	13.761	7.650		7.803		7.959		-		7.959	Continuing	Continuing	Continuing
Operations and Support - Teleport Sustainment	MIPR	SPAWAR : San Diego, CA	4.844	-		-		-		-		-	-	4.844	-
Operations and Support - Unit Personnel, Control System Improvement Sustaining Support	SS/IDIQ	Lockheed Martin Team : Arlington, VA	84.457	62.113		62.215		63.233		-		63.233	Continuing	Continuing	Continuing
Operations and Support - Warfighter Training	IA	Lockheed Martin Team : Arlington, VA	2.661	-		-		-		-		-	2.661	5.322	2.661
Concurrent, Test, Training, and Operations (CTTO) - Concurrent Test, Training And Operations	SS/CPAF	Northrop Grumman : Boeing	3.175	-		0.700		0.735		-		0.735	Continuing	Continuing	Continuing
Concurrent, Test, Training, and Operations (CTTO) - Concurrent Test, Training And Operations/Training Enhancements	SS/IDIQ	Lockheed Martin Team Arlington,VA : Huntsville, Al, Colorado Springs, CO	15.194	21.524		16.743		17.337		-		17.337	Continuing	Continuing	Continuing
Concurrent, Test, Training, and Operations (CTTO) - Concurrent Test, Training, Test and Operations	SS/FPAF	COLSA ARC : Huntsville, AL	0.000	-		3.650	Oct 2014	3.833		-		3.833	Continuing	Continuing	Continuing
Subtotal			124.092	91.287		91.111		93.097		-		93.097	-	-	-

Remarks
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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Support (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Test and Evaluation (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Remarks

N/A

	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	124.092	91.287	91.111	93.097	-	93.097	-	-	-

Remarks

N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
 Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support									✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support	1	2016	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency										Date: February 2015		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	29.518	19.251	25.668	19.795	-	19.795	21.831	21.706	23.596	24.925	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2015, Program Wide Support reflects a proportional change as a result of an increase and in FY 2016, reflects a proportional decrease as a result of a decrease to the Ballistic Missile Defense Command and Control, Battle Management & Communication program. Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

A. Mission Description and Budget Item Justification

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

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

	FY 2014	FY 2015	FY 2016
Title: Program Wide Support	19.251	25.668	19.795
Articles:	-	-	-
Description: N/A			
FY 2014 Accomplishments: See paragraph A: Mission Description and Budget Item Justification			
FY 2015 Plans: See paragraph A: Mission Description and Budget Item Justification			
FY 2016 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016
See paragraph A: Mission Description and Budget Item Justification			
Accomplishments/Planned Programs Subtotals	19.251	25.668	19.795

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
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Support (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	1.880	0.075		2.164		-		-		-	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPRs)	MIPR	Various : Multi: AK/AL/CA/CO/HI/MD/VA/NJ/NY/OCONUS	0.013	-		-		-		-		-	0.015	0.028	-
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL, CA, CO, HI, VA	2.088	-		-		-		-		-	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Various : Multi: AK, AL, CA, CO, HI, VA	22.388	-		-		-		-		-	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Various : Multi: AK, AL, CA, CO, VA	0.349	19.176		22.062		6.218	Nov 2015	-		6.218	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services Civilian Salaries, Travel, Training	Allot	Various : Multi: AL, CA, CO, VA	2.800	-		-		13.577	Nov 2015	-		13.577	2.800	19.177	-
Program Wide Support - Agency Operations, Sustainment and GPC	Allot	Various : Multi: AL, CO, VA etc.	0.000	-		1.442		-		-		-	Continuing	Continuing	Continuing
Program Wide Support - Facilities Maintenance SRM	MIPR	Various : Multi: AK, CA, CO, AL, MD, NJ, VA	0.000	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			29.518	19.251		25.668		19.795		-		19.795	-	-	-

Remarks
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
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	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.518	19.251	25.668	19.795	-	19.795	-	-	-

Remarks
N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Missile Defense Agency **Date:** February 2015

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
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Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
 Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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	3	4
MD40 Program-Wide Support									✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦	✦

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Missile Defense Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2016	4	2020