Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Missile Defense Agency	Date: May 2017
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603882C *I Ballistic Missile Defense Midcourse Defense Segment*

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

Program MDAP/MAIS Code: 362

Note

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

A. Mission Description and Budget Item Justification

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

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

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

Change Summary Explanation

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

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

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD08: *Ground Based Midcourse*	2,191.513	1,193.273	815.796	777.692	-	777.692	579.986	598.610	518.755	509.040	Continuing	Continuing
Quantity of RDT&E Articles	11	-	-	-	-	-	-	-	-	-		

Note

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

A. Mission Description and Budget Item Justification

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

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

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

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
(CVT-02) -Initiated upgrade and non-tactical equipment integration of two previously fielded GBIs to support the first GBI salvo test, FTG-11 -Improved ability to repair fielded GBIs and upgrade previously fielded GBIs for flight testing by acquiring EKV, Booster Avionics Module (BAM), and Booster Stack limited life item replacement units and spares -Developed new versions of EKV software (implements Near-Term discrimination improvements) and the initial C2 booster software to reduce risk to the CE-II Block 1/C2 interceptor flight test (FTG-15) and future fielding -Initiated acquisition for booster software to support a system-selectable 2- or 3-stage mode for integration into the operational fleet; providing the warfighter increased flexibility			
FY 2017 Plans: -Complete development of Configuration 2 (C2) integrated boost vehicle with Consolidated Booster Avionics Upgrade (CBAU) and CE-II Block I Exoatmospheric Kill Vehicles (EKV) Ground Based Interceptors (GBIs 48-58) to support both operations and testing, including a flight test to demonstrate the capability of the CE-II Block 1 with C2 CBAU booster GBIs -Continue flight test rotation program of fielded GBIs by upgrading kill vehicles and boosters, adding the necessary non-tactical equipment to support the Integrated Master Test Plan (IMTP) requirements -Complete delivery of EKV, Booster Avionics Module (BAM), and Booster Stack limited life item replacement units, operational spares, repair parts and materials required for interceptor repair and Flight Test Rotation upgrade activities -Continue EKV software development in accordance with the Software Development Plan (SDP) to implement enhancements and defect corrections for multiple versions of EKV software for fielded and Flight Test Rotation interceptors -Field Near-term discrimination improvements capability and test Mid-term capability -Complete delivery of the Divert Attitude Control System Alternate Propellant Tank to support fielding 44 GBIs by the end of CY 2017 and to provide improved reliability, manufacturability, and consistency in performance over the expected life span of a GBI			
FY 2018 Plans: -Test and field interceptor software upgrade with improved mid-term discrimination capability and capabilities to improve EKV performance reliability for known issues in order to enhance system capability against robust threat systems -Deliver two flight test configured interceptors to support the first GBI salvo test (FTG-11) -Begin work to ensure no fewer than 44 GBIs are deployed through the FYDP			
Title: Ground Based Interceptor Manufacturing	476.199	241.637	125.272
Articles:	-	-	-
Description: The Ground Based Interceptor (GBI) Program will continue to manufacture GBIs to support the DoD mandate of 44 fielded GBIs by 2017.			
FY 2016 Accomplishments:			

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

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

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

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

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Description: GMD Systems Engineering and Program Management provide essential services for the development and fielding of the GMD hardware and software and Industry Program Management operations. Included in this effort are concept definition, requirements and interfaces, system design, integration, test planning and verification efforts. Key products are development and maintenance of the technical baseline and critical engineering processes for implementation and delivery of an integrated GMD element capability. Program Management provides for prime contractor management of the GMD program. This effort includes program and business management, program administration, technical and testing oversight, verification of hardware and software development, quality/ safety/mission assurance, integrated logistics support, and infrastructure to develop, test and sustain the GMD system and components. ***FY 2016 Accomplishments:*** -Continued requirements development, engineering analysis, capability integration, and performance verification for GMD development and BMDS integration for the evolving threat -Continued sustainment of core information technology data and unified communications services to accomplish research and development activities. -Continued Technical Direction Agent activities to provide the technical expertise and program execution experience required to offer independent assessment/analysis, unbiased and objective defensive weapon system level-oriented advice on technical issues and product development, and recommendations on technical issues and product development challenges facing in the GMD Program -Continued modeling and simulation development and integration to assess component and system performance in support of annual technical assessments -Continued the development of modeling and simulation wrapped tactical code to reduce the life cycle cost and increase the fidelity of the results and integrate GMDSim into the new Objective Simulation Framework (OSF) -Continued modeling and simulation verification, validation, and accreditation (VV&A) to establish high confidence for Warfighter assessments -Continued design, planning, and pre- and post-flight test analysis for current and future flight and ground tests to assess system performance and implement a rigorous test plan for verifying successful operation of capabilities delivered to the Warfighter -Utilized Exoatmospheric Kill Vehicle (EKV) Hardware in the loop (HWIL) 10-foot vacuum space chamber (10V Chamber) for operational analysis of emerging threats, discrimination improvements performance and Pre-Mission Testing and Post Flight analysis and reconstruction in accordance with the Integrated Master Test Plan (IMTP) to reduce execution risks from additional data and gaining confidence that capabilities performed as expected -Provided contractor program management, subcontract management, quality assurance, verification of hardware and software			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
development, and technical and testing oversight to ensure the program meets all cost, schedule, and performance requirements -Fielded Near-term discrimination improvements capability -Completed Near-term discrimination improvements ground testing via ground test distributed (GTD-06) -Initiated top-down and bottoms-up requirements audit to include: functional decomposition / traceability, bottoms-up verification sufficiency audit, and establish detailed performance requirement error budgets and allocations to ensure complete understanding of system capability and potential gaps -Initiated a rigorous independent verification and validation (IV&V) and system engineering analysis of GMD software to increase Warfighter confidence in the tactical system performance and reliability			
FY 2017 Plans: -Continue requirements development, engineering analysis, capability integration, and performance verification for GMD development and BMDS integration -Continue effort to assess the current GMD capabilities against the evolving threat -Continue sustainment of core information technology data and unified communications services to accomplish research and development activities. -Continue Technical Direction Agent activities to provide the technical expertise and program execution experience required to offer independent assessment/analysis, unbiased and objective defensive weapon system level-oriented advice on technical issues and product development, and providing recommendations on technical issues and product development challenges facing in the GMD Program -Continue modeling and simulation development and integration to assess component and system performance in support of annual technical assessments -Continue the development of modeling and simulation wrapped tactical code to reduce the life cycle cost and increase the fidelity of the results and integrate GMDSim into the new Objective Simulation Framework (OSF) -Continue modeling and simulation verification, validation, and accreditation (VV&A) to establish high confidence in Warfighter assessments -Continue design, planning, and pre- and post-flight test analysis for current and future flight and ground tests to assess system performance and implement a rigorous test plan for verifying successful operation of capabilities delivered to the Warfighter -Utilize Exoatmospheric Kill Vehicle (EKV) Hardware in the loop (HWIL) 10-foot vacuum space chamber (10V Chamber) for operational analysis of emerging threats, discrimination improvements performance and pre-mission testing and post flight analysis and reconstruction in accordance with the Integrated Master Test Plan (IMTP) to reduce execution risks and gain confidence that capabilities performed as expected -Provide contractor program management, subcontract management, quality assurance, verification of hardware and software design, and technical and testing oversight to ensure the program meets all cost, schedule, and performance requirements			

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

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

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

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
-Continue sustainment of core information technology data and unified communications services to accomplish research and development activities			
Title: Ground Systems & Fire Control	163.714	117.369	212.732
Articles:	-	-	-
Description: The GMD Ground Systems enable control and operation of the GMD Element as part of the Ballistic Missile Defense System (BMDS). Ground Systems consists of the GMD Fire Control system, GMD Communications Network, In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT), Launch Site Components (LSC) (silos, silo interface vaults [SIVs]), and the Launch Support Systems (LSS) (Command and Launch Equipment (CLE), which includes Launch Support Equipment (LSE). ***FY 2016 Accomplishments:*** -Initiated requirements and preliminary design efforts for IDT technology upgrades to support enhanced data rates and message sets required for the On-Demand Communications to the Redesigned Kill Vehicle -Tested Ground Systems suite 6B3 in CTV-02+ flight test and ground tests, and initiate fielding of software upgrade for Near-Term Discrimination (NTD) capability, and Near-term BMDS discrimination improvements capability, including limited Reliability/ Obsolescence/Technology Refresh of the Ground System hardware to the Warfighter -Continued design and development for Ground Systems suite 7A to integrate limited IDT component upgrades, and CLE/GFC Re-architecture Phase I, and interface with C2BMC build 8.2 -Continued Ground Systems suite 7B upgrades for mid-term discrimination improvements to provide data aggregation, update salvo-logic, midterm threat set, 2-stage interceptor capability, and on-demand communications supporting Redesigned Kill Vehicle capabilities (RKV), into the GMD configuration -Continued Technology Refresh to address obsolescence issues to support improved availability, reliability, sustainability, and Cybersecurity posture -Completed integration efforts for an In-Flight Interceptor Communications System (IFICS) Data Terminal (IDT) at Fort Drum, NY to provide increased system performance in specific engagement scenarios -Completed the refurbishment, upgrade, blast shielding, and hardening of Missile Field 1 at Fort Greely, Alaska -Continued the Command Launch Equipment (CLE)/GFC Re-architecture Phase 1 to mitigate obsolescence, and increase reliability, sustainability, and availability of the CLE with added failover capability ***FY 2017 Plans:*** -Continue the CLE/ GMD Fire Control system (GFC) Re-architecture Phase 1 to mitigate obsolescence, and increase reliability, sustainability, and availability of the CLE with added failover capability -Complete fielding of Ground Systems suite 6B3 software upgrade for Near-Term Discrimination (NTD) capability, and Near-term BMDS discrimination improvements capability, including limited Reliability/Obsolescence/Technology Refresh of the Ground System hardware to the Warfighter			

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

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

C. Other Program Funding Summary ($ in Millions)

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

Remarks

D. Acquisition Strategy

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

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

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

E. Performance Metrics

N/A

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Product Development ($ in Millions)

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

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Product Development ($ in Millions)

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

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Product Development ($ in Millions)

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

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Product Development ($ in Millions)

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

Remarks

N/A

Support ($ in Millions)

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

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Support ($ in Millions)

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

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Support ($ in Millions)

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

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Support ($ in Millions)

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

Remarks

N/A

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

Remarks

N/A

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

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

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

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

Schedule Details

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

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency			Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MC08 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MC08: *Cyber Operations*	6.848	14.686	4.563	18.818	-	18.818	22.495	23.766	22.702	16.623	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

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

A. Mission Description and Budget Item Justification

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

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

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

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
FY 2016 Accomplishments: see above ***FY 2017 Plans:*** see above ***FY 2018 Plans:*** see above			
Title: Cybersecurity	8.997	0.000	14.055
Articles:	-	-	-
Description: Implements the GMD Cybersecurity Program and Defense in Depth Cybersecurity Strategy for the GMD Weapon System's Research, Development, Test, and Operational Mission Environment Systems, Networks, and Enclaves to ensure Confidentially, Integrity, and Availability of the System to the Warfighter. ***FY 2016 Accomplishments:*** -Initiated enhancement of the cybersecurity posture and further compliance with Risk Management Framework criteria -Initiated cybersecurity Operations Upgrade Program consisting of efforts to enhance the cybersecurity posture of the GMD operational information systems and its supporting information systems and components ***FY 2017 Plans:*** N/A ***FY 2018 Plans:*** -Increase from FY 2017 to FY 2018 is due to increased efforts to mitigate cyber security threats. -Continue assessing, implementing, documenting, and validating up to 512 cybersecurity control families (1935 security protections and control enhancements) for 25 representative systems which are comprised of 250,000 computing and logic bearing components supporting the GMD Development, Test, Training, and Operational missions. This will result in improved Confidentiality, Integrity, and Availability of the GMD System while ensuring mandatory compliance with Risk Management Framework -Continue implementing necessary upgrades to enhance the cybersecurity posture of the GMD operational environments and it's supporting information systems and networks while remaining responsive to active or emerging cyber threats against GMD -Continue ensuring compliance with security mandates to maintain continued authorization to operate while eliminating or reducing risks assessed against the program by implementing vulnerability mitigation activities			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

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

C. Other Program Funding Summary ($ in Millions)

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

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency			Date: May 2017
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*	

Support ($ in Millions)

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

Remarks

N/A

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

Remarks

N/A

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

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

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

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

Schedule Details

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

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency			Date: May 2017
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	182.891	52.521	41.721	31.587	-	31.587	28.361	28.671	25.994	26.038	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

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

A. Mission Description and Budget Item Justification

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

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018
Title: Program Wide Support	52.521	41.721	31.587
Articles:	-	-	-
Description: N/A			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: N/A			
Accomplishments/Planned Programs Subtotals	52.521	41.721	31.587

Exhibit R-2A, RDT&E Project Justification: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency		Date: May 2017
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

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

Remarks

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

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Missile Defense Agency			Date: May 2017
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*	

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

Remarks

N/A

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

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

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧

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

Schedule Details

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