

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	3,007.310	798.395	741.076	727.479	-	727.479	718.949	703.473	505.529	527.720	Continuing	Continuing
MD09: Aegis BMD	2,538.845	285.052	227.223	292.462	-	292.462	341.861	336.405	285.224	287.994	Continuing	Continuing
MG09: Aegis BMD SM-3 Development Articles	-	194.018	120.217	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	314.235
MM09: Aegis BMD SM-3 Development	-	117.179	161.958	232.714	-	232.714	162.708	143.663	14.672	18.509	0.000	851.403
MC09: Cyber Operations	5.226	2.718	10.886	10.827	-	10.827	11.748	10.679	9.165	10.816	Continuing	Continuing
MX09: Aegis BMD Development Support	190.248	157.811	185.742	163.628	-	163.628	172.649	182.454	170.658	182.767	Continuing	Continuing
MD40: Program-Wide Support	272.991	41.617	35.050	27.848	-	27.848	29.983	30.272	25.810	27.634	Continuing	Continuing
Program MDAP/MAIS Code: 362												
Note Decrease from FY 2019 to FY 2020 reflects the following: - Reflects the completion of the SM-3 Block IIA FY16 manufacturing contract. - Transition of flight test execution support costs from this PE to PE 0604878C Aegis Test to ensure continued transparency and program efficiency. - Transition of Common Source Library (CSL), BMD 5.0 CU software maintenance, and transition of Test Site Usage for in-service baselines from RDT&E to O&M. - Resolution of hardware availability issues and increased commonality within the SM-3 Missile family with utilization of previous material acquisitions of Kinetic Warhead (KW) and Guidance Section (GS).												
A. Mission Description and Budget Item Justification The Aegis BMD mission is to deliver an enduring, operationally effective and supportable BMD capability to defend the nation, deployed forces, friends and allies, and to increase this capability by delivering evolutionary improvements as part of Ballistic Missile Defense System (BMDS) upgrades. The Aegis BMD element of the BMDS capitalizes upon and evolves from the existing United States Navy Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures. Aegis BMD provides a forward-deployable, mobile capability to detect and track Ballistic Missiles of all ranges, and the ability to destroy Short-Range Ballistic Missiles (SRBMs), Medium-Range Ballistic Missiles (MRBMs), and Intermediate-Range Ballistic Missiles (IRBMs) in the midcourse phase of flight, and shorter range missiles in the terminal phase of flight. Aegis BMD also provides a Long Range Surveillance and Track (LRS&T) capability to the BMDS. Upgrades to both the Aegis BMD Weapon System and the Standard Missile-3 (SM-3) configuration enable Aegis BMD to provide effective, supportable defensive capability against longer range, more sophisticated threats and an enduring Aegis Ashore defensive capability.												

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Missile Defense Agency	Date: March 2019
---	-------------------------

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>
---	--

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

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	860.788	767.539	780.085	-	780.085
Current President's Budget	798.395	741.076	727.479	-	727.479
Total Adjustments	-62.393	-26.463	-52.606	-	-52.606
• Congressional General Reductions	-2.500	0.000			
• Congressional Directed Reductions	-31.451	-30.463			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	30.800	4.000			
• Congressional Directed Transfers	-41.247	0.000			
• Reprogrammings	-0.573	0.000			
• SBIR/STTR Transfer	-13.422	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-4.000	0.000	-52.606	-	-52.606

Change Summary Explanation

Decrease in FY 2018 from PB19 to PB20 reflects the enacted congressional adjustments for Aegis BMD 6.x development due to excess growth and SM-3 Block IIA All Up Rounds (AURs) transferred to Procurement

Decrease in FY 2019 from PB19 to PB20 reflects Congressional reduction of Weapon System Capability due to early to need (RDT&E)

Decrease in FY 2020 from PB19 to PB20 reflects the following:

- Transition of flight test execution support costs from this PE to PE 0604878C Aegis Test to ensure continued transparency and program efficiency.
- Transition of Common Source Library (CSL), BMD 5.0 CU software maintenance, and transition of Test Site Usage for in-service baselines from RDT&E to O&M
- Resolution of hardware availability issues and increased commonality within the SM-3 Missile family with utilization of previous material acquisitions of KW and GS

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MD09: Aegis BMD	2,538.845	285.052	227.223	292.462	-	292.462	341.861	336.405	285.224	287.994	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2019 to FY 2020 provides the following:

- Aegis BMD 5.x capability upgrade which adds new BMD threats inherent in the SM-3 Block IIA Build 8 missile software and improve Raid performance through Force Level Engagement and Sensor Coordination Raid (FENSRR)
- Aegis Baseline 5.4 (BMD 4.1) certification in FY2020 and begins development of Aegis Baseline 5.4 (BMD 4.2) which adds radar refurbishment and Low Noise Amplifiers (LNA) upgrades
- Requirements to modify Aegis BMD models in support of BMDS Ground Test re-architecture, all-Digital BMDS M&S architecture, additional model development, analysis and M&S simulation support

A. Mission Description and Budget Item Justification

Aegis BMD continues development of a Sea-Based BMD capability in support of the MDA's mission to protect the homeland, deployed forces, friends and allies from ballistic missile threats of all ranges and in all stages of flight.

Systems Engineering & Integration performs requirements development, engineering analysis, capability integration, and performance verification for Aegis BMD development and BMDS integration.

Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion enables cross-baseline specification management and capability assessments to ensure consistent application of technical standards, processes, and procedures across the Aegis BMD program. Aegis BMD specific efforts include: systems engineering and architecture (process and execution); modeling and simulation (M&S); Verification and Validation (V&V) test and evaluation support; ship integration; quality; safety and mission assurance M&S. V&V efforts in this accomplishment are performed at the Aegis BMD element level, which feed into the overall BMDS system level.

Aegis BMD 4.1 capability builds upon legacy Aegis BMD 4.0 and captures all the threats built into Aegis BMD 5.0 CU. It includes an increased BMD threat set, and provides increased maximum engagements and maximum missiles-in-flight over BMD 4.0.

Aegis BL 5.4 (BMD 4.1) merges the BMD 4.1 capability with the U. S. Navy (USN) Aegis Baseline 5.3 into a single integrated computer program with planned U.S. Navy Certification in FY 2019. 21 legacy Aegis Flight I/II Destroyers, not planned for Aegis Modernization (AMOD), possess two separate certified computer programs: Aegis BMD 4.0 for BMD missions and Aegis Baseline 5.3 for Anti-Air Warfare (AAW), Surface Warfare (SUW), and Undersea Warfare (USW). The Aegis BL 5.4 (BMD 4.1) computer program integrates Aegis Baseline 5.3 and Aegis BMD 4.0 to remedy the need for the warfighter to use both simultaneously. An additional benefit of the single integrated computer program is enabling future SPY-1 Low Noise Amplifier (LNA) Refurbishment efforts to be added during the ship's Service Life.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD		
Aegis BL 5.4.X (BMD 4.2) AN/SPY-1 upgrade with the U.S. Navy provides refurbishment of existing ship AN/SPY-1 radar arrays with the installation of antenna LNAs (MDA funding beginning in FY 2019). MDA and PEO IWS will establish a rotatable pool of antenna arrays to be installed and the removed arrays will be refurbished for the follow-on installation. These refurbished and upgraded antennas, when integrated with Aegis BL 5.4.X (BMD 4.2), will increase BMD capabilities with improved sensitivity, discrimination, and more efficient radar resource utilization.				
Aegis BMD 5.1 builds upon Aegis BMD 5.0 CU (COTS based open architecture) and further expands the threat set required for EPAA Phase III. This includes the integration of the SM-3 Block IIA, introduction of an Engage on Remote (EoR) capability, and improved BMDS interoperability and engagement coordination. The Aegis BMD 5.1 computer program will also incorporate new BMD threats inherent in the SM-3 Block IIA Build 8 missile software and improve Raid performance through FENSR.				
Aegis BMD 6.0 provides an increased BMD capability by incorporating the Air and Missile Defense Radar (AMDR), now designated SPY-6, for introduction on the first DDG Flight III. Aegis BMD 6.0 will enable BMDS element utilization of AMDR data for remote engagement and supplement deployed assets with simultaneous multi-mission capabilities (e.g. Integrated Air and Missile Defense (IAMD)). It will include IAMD planning; search, track, and discrimination. SPY-6 will support force level (multi-asset) approach to raid defense and enable U.S. Navy ships greater stand-off range from threat environments.				
Aegis Underlay funds Aegis Weapon System and SM-3 Block IIA software modifications to existing systems to support a phased delivery of operational capability against expanded threat/mission space.				
Modeling & Simulation (M&S) Objective Simulation Framework (OSF) effort develops, maintains and deploys the framework hardware and software for use at element laboratories and Combatant Command (CCMD) locations to support IMTP events, BMDS capability delivery assessments, Warfighter training, exercises, and wargames.				
M&S BMDS Simulations & Tools effort provides development and sustainment of digital products and the architecture framework, and delivery/maintenance of infrastructure for BMDS performance assessments.				
BMD System Assessment and Verification, Validation & Assessment (VV&A) funds activities to support BMDS Operational Capacity Baseline (OCB) delivery decisions and Technical Capability Declarations (TCDs), and anchor System modeling and simulation.				
Land Based SM-3 Site Activation provides site design, site activation, temporary facilities, base operations support, and utilities as site activation progresses and until sites are transferred to the Navy.				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020
Title: Systems Engineering & Integration		18.530	19.310	20.780
Articles:		-	-	-
Description: Perform requirements development, engineering analysis, capability integration, and performance verification for Aegis BMD development and BMDS integration, including Aegis BMD compliance with the BMDS Specification, BMDS Description Document, and Master Integration Plan (MIP).				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2019	FY 2020
<div>Recurring Accomplishments:</div> <div><div>- Conduct system level performance analyses to support ongoing BMDS Architecture and Systems Engineering efforts</div><div>- Perform top-down system level engineering analysis, capability integration, and performance verification for Aegis BMD development and BMDS integration, including Aegis BMD compliance with the BMD System Specification, BMD System Description Document, and Master Integration Plan (MIP)</div><div>- Identify architecture alternatives that improve the BMD System's performance and are complementary to and interoperable with NATO systems and theaters around the world</div><div>- Define BMDS technical content expectations and develop system requirements, to include integration of new capabilities, such as the U.S. Navy's Air and Missile Defense Radar (AMDR)</div><div>- Develop functional performance, interface, and design suitability requirements in collaboration with Aegis BMD engineers to ensure correct flow-down and allocation of BMD System-level requirements to Aegis BMD</div><div>- Respond to Warfighter, Combatant Command and other requests for analyses and requests for information; provide analytical support for real-world events</div><div>- Conduct non-advocate assessments of BMDS capabilities and limitations prior to capability delivery decisions to determine fielding readiness (including Theater/Regional BMD)</div><div>- Conduct extensive analysis of data collected in BMD test events to evaluate BMD System operations and performance.</div></div> <div>Specific and/or unique accomplishments to each FY are as follows:</div> <div><div>FY 2019 Plans:</div><div>- SEE ABOVE.</div><div>FY 2020 Plans:</div><div>- SEE ABOVE.</div><div>FY 2019 to FY 2020 Increase/Decrease Statement:</div><div>N/A</div></div>					
<div>Title: Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion</div> <div>Articles:</div> <div>Description: Aegis BMD Core System Engineering enables cross-baseline specification management and capability assessments to ensure consistent application of technical standards, processes, and procedures across the Aegis BMD program. Aegis BMD specific efforts include: systems engineering and architecture (process and execution), modeling and simulation (M&S), Verification and Validation (V&V) test and evaluation support, ship integration, quality, safety and mission assurance M&S, V&V efforts in this accomplishment are performed at the Aegis BMD element level, which feed into the overall BMDS system level.</div> <div>Recurring Accomplishments:</div> <div>- Conduct U.S. Navy and Joint Link certifications required for BMD Baseline certifications for operational deployment</div>			43.432 -	45.542 -	53.041 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>	Project (Number/Name) MD09 / <i>Aegis BMD</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019
<ul style="list-style-type: none"> - Support Ground Test Campaign for BMDS to achieve Operational Capability Baseline (OCB) declaration - Execute V&V activities and provide results to MDA System Verification Team and the OTA in support of BMD system level accreditation for BMDS events - Provide M&S Requirements Management and Development - Conduct further development of Aegis BMD System Architecture and overarching system concepts - Conduct BMDS system level requirements allocation and Aegis BMD system requirements development, trace, validation and verification, and configuration management for coordination with all participating external agencies and organizations - Perform Command, Control, Computer, Communications and Intelligence (C4I) systems engineering to further develop Aegis BMD requirements, and to identify and resolve BMDS interoperability issues - Define and coordinate development and implementation of C4I capabilities in U.S. Navy C4I programs of record to meet Aegis BMD requirements - Conduct Threat Engineering analysis and Requirements Assessment - Conduct Systems Engineering for Aegis BMD system-level M&S development and interfaces to the BMDS architecture - Provide verified, validated, accredited models in support of U.S. Navy certification, MDA characterization of system-level performance, Operational Test Agency (OTA) assessment of operational capabilities, and representation of Aegis BMD capabilities in BMD test and exercise venues - Provide target engineering, test planning activities, and IMTP process/inputs for Aegis BMD - Conduct Performance Assessment and Verification (PAV) processes which assess the sufficiency of Objective Quality Evidence (OQE) to provide a traceable evidence to verify ES requirements traced to BMDS requirements - Provide oversight of all Aegis BMD analysis in support of systems assessment and verification supporting test and analysis requirements and test planning inputs to align with MDA and U.S. Navy test programs - Provide consolidated analysis and reporting for firing events <p>Specific and/or unique accomplishments to each FY are as follows:</p>			
FY 2019 Plans:			
<ul style="list-style-type: none"> - Conduct Science & Technology evaluations, identify solutions for identified system needs, conduct concept exploration and related trade studies - Complete development of initial RF Mid-Term discrimination algorithms within the B/L 9 architecture - Execute Electronic Protection analysis and develop initial Electronic Attack mitigation concepts - Design, develop, test, and certify overhead satellite data sources to meet Aegis BMD fire control capabilities in support of dual path requirement in Aegis BMD 5.1 - Continue model development and V&V in support of COMOPTEVFORBL 9.C2 M&S accreditation - Continue support and oversight of development, integration and sustainment of M&S in support of BMD 6 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019
<p>- Continue to develop and mature Regional Sensor Advanced Discrimination solutions and modeling and simulation updates for multiple Aegis BMD architectures</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> - Continue model development and V&V in support of COMOPTEVFOR BL 9.C2 M&S accreditation - Continue support and oversight of development, integration and sustainment of M&S in support of BMD 6 - Continue Electronic Protection analysis and development of Electronic Attack mitigation concepts - Develop or modify Aegis BMD models and supporting M&S components to meet system-level and enterprise M&S infrastructure requirements for both the Ground Test re-architecture and all-Digital BMDS M&S architecture. - Continue to develop and mature Regional Sensor Advanced Discrimination solutions and modeling and simulation updates for multiple Aegis BMD architectures <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>Increase from FY 2019 to FY 2020 provides modifications to Aegis BMD models in support of BMDS Ground Test re-architecture and all-Digital BMDS M&S architecture and additional model development, analysis and M&S simulation support</p>			
<p>Title: Aegis BMD 4.x Development</p> <p align="right">Articles:</p> <p>Description: Aegis Baseline 5.4 (BMD 4.1) incorporates the BMD 5.0 CU capability of EPAA Phase II ENDO/EXO requirements including EPAA Phase II Exo-atmospheric threats, integration of the SM-3 Block IB Threat Upgrade (TU), and reintroduction of other Aegis capabilities integrated with the SM-6 Dual I (Endo only). It provides Aegis Modernization capabilities comparable to the BMD 4.0 ships with legacy computer processing architecture. Aegis Baseline 5.4 (BMD 4.2) will provide refurbishment of existing ship AN/SPY-1 radar arrays with the installation of Low Noise Amplifiers (LNAs). These refurbished and upgraded antennas will increase BMD capabilities with improved sensitivity, discrimination, and more efficient radar resource utilization. Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2019 Plans:</p> <p>For Aegis Baseline 5.4 (BMD 4.1):</p> <ul style="list-style-type: none"> - Complete computer program integration efforts, capability development and coding - Complete unit test and element computer program integration and test - Complete Engineering Test and Evaluation (ET&E), Multi-Element Integration and Test (MEIT) with regression testing - Conduct Engineering Assessment (EA) <p>FY 2020 Plans:</p> <p>Support of computer program delivery and to provide Objective Quality Evidence (OQE) for Certification:</p> <ul style="list-style-type: none"> - Conduct Aegis Baseline 5.4 (BMD 4.1) Ship Installation and Test on first ship to support U.S. Navy At-Sea Testing - Certify Aegis Baseline 5.4 (BMD 4.1) in FY 2020 		22.954	25.128
		-	-
		45.047	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020
<p>- Provide Aegis Baseline 5.4 (BMD 4.1) support to BMDS ground test events, collect Objective Qualitative Evidence (OQE) to support MDA Operational Capacity Baseline (OCB) reviews</p> <p>For Aegis Baseline 5.4 (BMD 4.2):</p> <p>- Update Critical Item Development (CIDS), Interface Description Specifications (IDS) and all supporting engineering document and plans</p> <p>- Conduct Aegis BMD low-level performance analysis supporting In-Process Reviews (IPR)</p> <p>- Conduct computer program integration efforts, capability development and coding; unit test and element computer program integration and test; Engineering Test and Evaluation (ET&E), Multi-Element Integration and Test (MEIT) with regression testing.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>Increase from FY 2019 to FY 2020 provides Aegis Baseline 5.4 (BMD 4.1) certification in FY 2020. Aegis Baseline 5.4 (BMD 4.2) development efforts start in FY 2020.</p>				
<p>Title: Aegis BMD 5.x Development</p> <p>Articles:</p> <p>Description: Aegis BMD 5.1 builds upon BMD 5.0 CU and will further expand the threat set to include those threats required for EPAA Phase III through the integration of the SM-3 Block IIA, introduction of EoR capability, and improved BMDS interoperability and engagement coordination. In addition to expanding the BMD battlespace, EoR with SM-3 Block IIA frees up radar resources and increases the number and type of threats that can be engaged simultaneously over previous baselines. Aegis BMD Phase 1 capabilities include SM-3 Block IIA missile integration, SM-3 weapons selection algorithm, enhanced tracking, discrimination and mission planner updates to support organic engagements, Launch-on-Remote (LoR) engagements, and Long Range Surveillance & Tracking (LRS&T) missions. Aegis BMD 5.1 Phase 1 integration, testing, and evaluation (IT&E) events include various lab-based and shipboard weapon-system-to-missile integration testing utilizing the Virtual Operational Missile (VOM) and the Inert Operational Missile (IOM), as well as participation in BMDS-wide ground test campaigns. Aegis BMD 5.1 Phase 1 development supports early integration and testing with the SM-3 Block IIA missile testing. The development of partial capability is contiguous across both Phase 1 and Phase 2 and supports delivery for EPAA Phase III. Aegis BMD 5.1 Combat System certification occurs in FY 2018. Post-certification upgrades include incorporating new BMD threats inherent in SM-3 Block IIA Build 8 missile software and improved raid performance through FENSRR, which preserves missile inventory and radar resources</p> <p>Recurring Accomplishments:</p> <p>- Continue supporting BMDS ground test events, collect Objective Qualitative Evidence (OQE) to support MDA OCB reviews, and EPAA Phase III TCD</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2019 Plans:</p>		76.772 -	12.678 -	32.656 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019
<p>- Continue supporting BMDS ground test events, collect Objective Qualitative Evidence (OQE) to support MDA OCB reviews, and EPAA Phase III TCD</p> <p>FY 2020 Plans:</p> <p>- Conduct ET&E and MEIT with regression testing for FENSR and Build 8 missile upgrades for the SM-3 Block IIA</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>Increase from FY 2019 to FY 2020 provides SM-3 Block IIA Build 8 required weapon system changes to incorporate new BMD threats inherent in missile software and improved raid performance through FENSR.</p>			
<p>Title: Aegis BMD 6.x Development</p> <p align="right">Articles:</p> <p>Description: U.S. Navy is developing the Advance Capability Build (ACB) 20 Combat System (CS) and the Air and Missile Defense Radar (AMDR), now designated SPY-6, for introduction on the first DDG Flight III. Aegis BMD 6.0 will integrate Aegis BMD 5.1 capability with the ACB 20 Combat System, to include new SPY-6 requirements. Aegis BMD 6.0 exploits SPY-6 radar improvement to enhance Engagement and Search &Track capabilities to include discrimination, raid defense and expanded threat space. This will enable BMDS element utilization of SPY-6 data for remote engagements and will supplement deployed assets with simultaneous multi-mission capabilities (e.g. IAMD). SPY-6 will support a force-level (multi-asset) approach to raid defense and will enable U.S. Navy ships to have a greater stand-off range from threat environments.</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Develop (CIDS), IDS and all supporting engineering documents and plans - Conduct design studies and concepts supporting development and integration - Conduct Aegis BMD performance analysis supporting In-Process Reviews(IPR) - Participation in program leadership and technical forums including Program Management Team, System Engineering Team, and Cross Product Teams for Integration and Test, Modeling & Simulation, Test, Evaluation & Certification, and Fleet Integration and Design - Computer program development for Aegis BMD 6.0 supporting Software Increment Reviews (SWIR) -MDA/Navy co-funded effort to provide BMD capability on Flight III DDGs <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Execute coordinated development with U.S. Navy on the combined computer program - Prepare for and conduct Aegis BMD performance analysis supporting CDR/Interim Program Review (IPR) - Compile Element Review Team (ERT) and CDR/IPR data packages and begin Element Technical Reviews (ETR) to validate system requirements 		43.155 -	63.479 -
			66.798 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2019	FY 2020
- Continue BMD 6.0 requirement updates, trade studies, design efforts, computer program coding and performance testing FY 2020 Plans: Aegis BMD 6.0 computer program development activities to support the Flight III DDG schedule: - Conduct Aegis BMD 6.0 concurrent engineering across BMD Surveillance and Track, Exo-organic, Endo-organic, and Mission Planner areas - Conduct SPY-6 integration efforts, capability development, and performance analysis - Conduct Aegis BMD 6.0 design and code across the BMD Mission area - Conduct Aegis BMD 6.0 unit test and element computer integration and test FY 2019 to FY 2020 Increase/Decrease Statement: N/A					
Title: Aegis Underlay Articles: Description: Aegis Weapon System and SM-3 Block IIA software modifications to existing systems to support a phased delivery of operational capability against expanded threat/mission space. This upgrade adds capability for Aegis BMD to provide an under layer capability to GMD in support of Homeland Defense and will operationalize FTM-44 capability with SM-3 Block IIA Build 8 & AWS 9.2 FY 2019 Plans: N/A FY 2020 Plans: -Conduct requirement definition for Aegis Homeland Defense Underlay -Conduct BMDS system level requirements allocation and Aegis BMD system requirements development, trace, validation and verification, and configuration management for coordination with all participating external agencies and organizations FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY 2019 to FY 2020 provides Aegis Weapon System and SM-3 Block IIA software modifications to existing systems to support a phased delivery of operational capability against expanded threat/mission space			0.000 -	0.000 -	12.000 -
Title: Modeling & Simulation Objective Simulation Framework Articles: Description: This effort develops, maintains and deploys the framework hardware and software for use at element laboratories and Combatant Command (CCMD) locations to support IMTP events, BMDS capability delivery assessments, Warfighter training, exercises, and wargames. Recurring Accomplishments:			35.448 -	35.882 -	36.337 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020
<div>- Develop and implement Objective Simulation Framework (OSF) upgrades to incorporate advanced tracking, discrimination, engagement and associated upper tier debris mitigation capabilities, as well as other requirements and capabilities to meet MDA's evolving M&S Enterprise needs.</div> <div>- Sustain and enhance framework products to maintain capabilities to support stakeholders.</div> <div>- Develop plans, procedures and documentation for scheduled events including Wargames and Combatant Command Exercises and the Distributed, Focused and Integrated HWIL Events as presented in the IMTP. Provide event architecture integration and checkout of Wargames for these same IMTP scheduled events.</div> <div>- Provide the ground test architecture integration expertise to meet the testing requirements of the IMTP. Support delivery of integrated architectures for test across all test venues using the BMDS test framework to integrate distributed architectures in support of BMDS.</div> <div>- Develop, maintain, test, field, and operate model representations for use in events and other MDA M&S stakeholder application areas. Deploy hardware and software updates to distributed sites. Perform regular maintenance and critical repairs of hardware and software.</div> <div>- Support MDA's Experimental End-to-end Digital Integrated System-level Simulation (X-EDISS) requirements, referred to Tier 2 Digital in previous reports, requirements, including hardware and software, data storage and transmission, and verification tools.</div> <div>- Control and maintain the M&S Integration and Development Laboratories for Element M&S. Maintain venue for stakeholders to conduct early integration efforts and identification of issues prior to event architecture integration to support system development.</div> <div>- Deploy System Interface Units (SIUs) for BMDS testing - materials, licenses, SIU fleet purchasing. Deploy SIUs and components to maintain and sustain SIU fleet including cybersecurity; enables Developmental and Operational testing with full BMDS as required in IMTP.</div> <div>- Continue maintenance of the Single Stimulation Framework in the required venues until the transition of the Objective Simulation Framework into the venues completes.</div> <div>Specific and/or unique accomplishments to each FY are as follows:</div> <div>FY 2019 Plans:</div> <div>-SEE ABOVE.</div> <div>FY 2020 Plans:</div> <div>- SEE ABOVE.</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:</div> <div>N/A</div>				
Title: M&S BMDS Simulations & Tools		5.227	4.767	4.647
Articles:		-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2019	FY 2020
<p>Description: This effort includes: development and sustainment of digital products and the architecture framework, and delivery/ maintenance of infrastructure for BMDS performance assessments.</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none">- Integrate, test, and verify the M&S enterprise supporting BMDS testing, assessment, exercises, and wargaming, including testing infrastructure. Guide and facilitate integration testing of MDA's M&S frameworks and core truth models, and all M&S components into virtual representations of the BMDS that are credible, affordable, and provide decision makers with the data needed- Integrate, test, functionally qualify, and deliver M&S tools and complex test architectures to provide system test capabilities to support MDA IMTP based test events, wargames, and exercises- Continue the transition of real-time digital simulation capability to the OSF to support Intended Uses- Provide HWIL/M&S Benchmarking/Integration documentation and coordination- Conduct M&S system integration and verification to support M&S system architecture development. Provide developmental integration testing to support M&S system architecture integration <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2019 Plans:</p> <p>- SEE ABOVE.</p> <p>FY 2020 Plans:</p> <p>- SEE ABOVE.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>N/A</p>					
<p>Title: BMDS Verification, Validation & Assessment (VV&A)</p> <p align="right">Articles:</p> <p>Description: This activity funds BMD System Assessment and VV&A activities to support BMDS Operational Capacity Baseline (OCB) delivery decisions and Technical Capability Declarations (TCDs), and anchor System modeling and simulation.</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none">- Verify BMDS performance, and produce BMDS verification status reports- Conduct extensive analysis of data collected in BMDS ground and flight test events, instrumental to understanding BMD System operations and performance and anchoring models and simulations- Identify mitigation approaches for BMDS performance issues uncovered during system level analysis and assessment- Maintain M&S VV&A database, and verification data for BMD System Specification Change Notices- Develop, maintain, and update the M&S VV&A tool kit- Provide recommendations for improving assessment confidence, including M&S and testing issue resolutions			20.219 -	20.437 -	21.156 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD		Project (Number/Name) MD09 / Aegis BMD	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2019	FY 2020
<p>- Conduct verification and validation (V&V) in support of MDA BMD System level accreditation process in support of BMDS Ground Test and performance assessment events</p> <p>- Conduct specified BMD System post-flight reconstructions, element post-flight reconstructions, and pre-mission testing events so as to optimize the body of evidence and analysis supporting system-level BMDS accreditation.</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2019 Plans:</p> <p>- SEE ABOVE.</p> <p>FY 2020 Plans:</p> <p>- SEE ABOVE.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>N/A</p>					
<p>Title: Land Based SM-3 Site Activation</p> <p align="right">Articles:</p> <p>Description: Provide site design, unexploded ordnance clearing; spectrum analysis studies; temporary facilities; utilities; administrative communications equipment and services; infrastructure modifications; generator and commercial power; leased vehicles; material handling equipment; generator fuel; supplies, barriers temporary lighting; transportation of materials and equipment; translators; and emerging requirements as site activation progresses and until sites are transferred to the Navy. Recurring Accomplishments include:</p> <p>-Provide site activation for Aegis Ashore site in Poland to include temporary site activation facilities, base operation support, utilities, administrative communications, on-site material handling equipment services, and equipment installation</p> <p>-Fuel for facility commissioning activities, backup generators, and on-site vehicle support</p> <p>-Technical support to facilitate processing facility change proposals and construction modifications</p> <p>-Post-award technical services (structural, mechanical, and electrical) to ensure quality standards and construction schedule is met</p> <p>FY 2019 Plans:</p> <p>N/A</p> <p>FY 2020 Plans:</p> <p>N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>			19.315 -	0.000 -	0.000 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>	Project (Number/Name) MD09 / <i>Aegis BMD</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020
FY 2018 congressional plus up received for Aegis Ashore Poland. Additional FY 2018 and FY 2019 out year efforts are funded in PE 0604880C: Land Based SM-3			
Accomplishments/Planned Programs Subtotals	285.052	227.223	292.462

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 0604878C: <i>Aegis BMD Test</i>	128.757	92.160	169.822	-	169.822	76.270	149.764	137.058	147.923	Continuing	Continuing
• 0604880C: <i>Land Based SM-3 (LBSM3)</i>	29.652	27.692	38.352	-	38.352	36.348	28.029	22.733	30.463	Continuing	Continuing
• 0604881C: <i>AEGIS SM-3 Block IIA Co-Development</i>	9.531	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.531

Remarks

D. Acquisition Strategy

The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively.

The M&S acquisition strategy utilizes full and open competition to develop, acquire and deliver the integrated architectures/frameworks, as well as develop and deliver models of Aegis systems. The Digital and HWIL product centers integrate the suite of M&S into a composite simulation capability, all based on an open architecture. M&S achieves this end-state via close collaboration between its integrating contractor teams (Digital and HWIL) and those of the Aegis BMD prime contractors, with additional technical standards and engineering oversight provided by Federally Funded Research and Development Centers (FFRDCs) and University Affiliated Research Centers (UARCs).

E. Performance Metrics

Aegis BMD utilizes Award Fee and Incentive-based contracts to ensure project completes on time

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering & Integration - Systems Engineering	Various	MDA Various : VA, AL	62.359	3.620	Oct 2017	2.111	Nov 2018	1.813	Nov 2019	-		1.813	Continuing	Continuing	Continuing
Systems Engineering & Integration - Systems Engineering - CSS	C/CPFF	TEAMS : VA	16.463	0.945	Nov 2017	3.113	Nov 2018	5.312	Nov 2019	-		5.312	Continuing	Continuing	Continuing
Systems Engineering & Integration - Systems Engineering - Industry	C/CPAF	Boeing : VA	49.025	13.965	Nov 2017	14.086	Nov 2018	13.655	Nov 2019	-		13.655	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD APL	MIPR	JHU/APL : Columbia, MD	17.340	9.643	Nov 2017	7.904	Nov 2018	9.639	Nov 2019	-		9.639	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD LM	C/CPFF	Lockheed Martin : Moorestown, NJ	17.604	5.742	Nov 2017	3.716	Nov 2018	3.277	Nov 2019	-		3.277	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD MIT	MIPR	Hanscom AFB - MIT/LL : Lexington, MA	10.503	4.778	Nov 2017	3.169	Nov 2018	3.775	Nov 2019	-		3.775	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD MITRE	MIPR	CECOM - MITRE : Dahlgren, VA	1.017	1.495	Nov 2017	1.228	Nov 2018	1.608	Nov 2019	-		1.608	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD NSWCDD	MIPR	NSWC DD : Dahlgren, VA	17.413	9.986	Nov 2017	7.285	Nov 2018	10.620	Nov 2019	-		10.620	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 Raytheon	SS/CPAF	Raytheon : AZ	1.587	0.000		0.825	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD						Project (Number/Name) MD09 / Aegis BMD			
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09- Technology Design and Insertion-TD No longer funding in the FYDP	Various	Various, : Various	7.834	0.000		0.000		0.000		-		0.000	0.000	7.834	0.000
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - SPAWAR	MIPR	SPAWAR : San Diego, CA	1.072	4.444	Dec 2017	5.255	Nov 2018	4.482	Nov 2019	-		4.482	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Technology Design and Insertion - Discrimination	MIPR	Various - MDA : AL,VA	9.972	5.923	Nov 2017	7.957	Nov 2018	3.745	Nov 2019	-		3.745	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Technology Design and Insertion - M&S improvements	MIPR	Various - MDA : AL, VA	0.000	0.000		0.000		8.812	Nov 2019	-		8.812	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Various - MDA	MIPR	Various - MDA : AL,VA,CA	2.471	1.421	Nov 2017	8.203	Nov 2018	7.083	Nov 2019	-		7.083	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev -MD09- Aegis Techrep	MIPR	AEGIS Techrep : Moorestown, NJ	2.653	0.552	Nov 2017	0.377	Nov 2018	2.844	Nov 2019	-		2.844	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. - MD09 - D	MIPR	MDA : VA	30.396	1.438	Nov 2017	0.000		5.216	Nov 2019	-		5.216	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis BMD 4.x Development - BMD 4.0 Dev. - MD09 - Dahlgren	MIPR	NSWC/DD : DAHLGREN, VA	147.077	2.442	Nov 2017	6.156	Nov 2018	3.912	Nov 2019	-		3.912	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. - MD09 - Lockheed Martin	SS/CPIF	LOCKHEED MARTIN : MOORESTOWN, NJ	795.890	18.522	Nov 2017	17.087	Nov 2018	30.059	Nov 2019	-		30.059	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. -MD09- BMD 4.0 Dev-	Various	Various : Various	43.102	0.000		1.508	Nov 2018	3.016	Nov 2019	-		3.016	0.000	47.626	0.000
Aegis BMD 5.x Development - 6.x - D	MIPR	MDA : Ft. Belvoir, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 20117142323680	MIPR	NSWC/DD : DAHLGREN, VA	60.134	15.677	Nov 2017	1.400	Nov 2018	5.896	Nov 2019	-		5.896	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 20117142323684	MIPR	NSWC/PHD : PT HUENEME, CA	9.588	1.875	Nov 2017	0.000		0.591	Nov 2019	-		0.591	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 20117142323686	SS/CPFF	JHU/APL/MD : COLUMBIA, MD	51.536	2.667	Nov 2017	0.460		1.787	Nov 2019	-		1.787	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 20117142323689	SS/CPAF	LOCKHEED MARTIN : MOORESTOWN, NJ	661.093	53.751	Nov 2017	9.170	Nov 2018	22.189	Nov 2019	-		22.189	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - AW	MIPR	Aegis Tech Rep : Moorestown, NJ	2.401	2.108	Nov 2017	0.000		0.750	Nov 2019	-		0.750	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - Various	MIPR	Various : MA, MD, VA, NJ	77.223	0.694	Nov 2017	1.648	Nov 2018	1.443	Nov 2019	-		1.443	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09- No longer funded in the FYDP	Various	Various : various	129.494	0.000		0.000		0.000		-		0.000	0.000	129.494	0.000

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis BMD 6.x Development - Hanscom AFB - MIT/LL - TD	MIPR	Hanscom AFB - MIT/LL : MA	1.970	0.840	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - JHU/APL	SS/CPFF	JHU/APL : MD	3.861	6.064	Nov 2017	3.902	Nov 2018	3.932	Nov 2019	-		3.932	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - Lockheed Martin	C/CPFF	Lockheed Martin : NJ	10.105	21.098	Nov 2017	51.773	Nov 2018	55.062	Nov 2019	-		55.062	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - MD09 - DD	MIPR	NSWC/DD : Dahlgren, VA	4.976	2.781	Nov 2017	3.902	Nov 2018	3.902	Nov 2019	-		3.902	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - NAVSEA	MIPR	NAVSEA : Sudbury, MA	0.000	1.500	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - NSWC DD-TD	MIPR	NSWC/DD : VA	3.321	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - Raytheon	MIPR	Raytheon : Tucson, AZ	1.375	7.373	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - Tech Rep	MIPR	Aegis TechRep : Moorestown, NJ	0.339	0.928	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - Various	MIPR	Various : MA, MD, VA, NJ, CA	2.985	2.571		3.902	Nov 2018	3.902	Nov 2019	-		3.902	Continuing	Continuing	Continuing
Aegis Underlay - Aegis Weapon System - MD09 - APL	SS/CPFF	JHU/APL : MD	0.000	0.000		0.000		0.756	Nov 2019	-		0.756	Continuing	Continuing	Continuing
Aegis Underlay - Aegis Weapon System - MD09 - Aegis Techrep	MIPR	Aegis Techrep : Moorestown NJ	0.000	0.000		0.000		0.324	Nov 2019	-		0.324	Continuing	Continuing	Continuing
Aegis Underlay - Aegis Weapon System - MD09 - DD	MIPR	NSWC DD : Dahlgren VA	0.000	0.000		0.000		0.540	Nov 2019	-		0.540	Continuing	Continuing	Continuing
Aegis Underlay - Aegis Weapon System - MD09 - LM	SS/CPFF	Lockheed Martin : Moorestown NJ	0.000	0.000		0.000		9.180	Nov 2019	-		9.180	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Underlay - Standard Missile - 3 (SM-3) BLock IIA Development - MD09 - Raytheon	SS/CPIF	Raytheon : AZ	0.000	0.000		0.000		1.200	Nov 2019	-		1.200	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering	Various	MDA : AL, VA	12.588	0.763	Nov 2017	3.211	Nov 2018	3.256	Nov 2019	-		3.256	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - CSS Support	C/CPFF	TEAMS : AL, CO	17.549	1.095	Nov 2017	4.480	Nov 2018	7.344	Nov 2019	-		7.344	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Engineering Support	C/CPAF	Northrop Grumman : CO	23.866	8.613	Nov 2017	5.845	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Integration	MIPR	AMRDEC : AL	20.498	3.625	Nov 2017	2.887	Nov 2018	3.090	Nov 2019	-		3.090	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Prime	C/CPFF	Teledyne Brown Engineering / TBD : AL, CO	116.960	21.352	Nov 2017	19.459	Nov 2018	22.647	Nov 2019	-		22.647	Continuing	Continuing	Continuing
M&S BMDS Simulations & Tools - Sims & Tools	C/CPFF	Teledyne Brown Engineering : AL, CO	1.130	1.243	Nov 2017	1.298	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M&S BMDS Simulations & Tools - Sims & Tools - Industry	C/CPAF	Northrop Grumman : CO	33.070	3.984	Nov 2017	3.469	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M&S BMDS Simulations & Tools - Sims & Tools - Industry (2)	C/CPAF	SWDC : CO	0.000	0.000		0.000		3.887	Nov 2019	-		3.887	Continuing	Continuing	Continuing
M&S BMDS Simulations & Tools - Sims & Tools - Various	Various	Various : AL, CO	0.000	0.000		0.000		0.760	Nov 2019	-		0.760	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
BMDS Verification, Validation & Assessment (VV&A) - Prior Year Verification & Assessment - No Longer in the FYDP	C/CPFF	Sparta : AL	1.585	0.000		0.000		0.000		-		0.000	0.000	1.585	0.000
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment	Various	MDA Various : AL, VA	0.773	0.709	Nov 2017	1.759	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - CSS Support	C/CPFF	TEAMS : AL	12.532	2.210	Nov 2017	1.323	Nov 2018	0.806	Nov 2019	-		0.806	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - Industry	C/CPAF	Boeing : AL	14.916	6.165	Nov 2017	6.429	Nov 2018	8.421	Nov 2019	-		8.421	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - Labs	MIPR	MITRE : VA	6.647	1.174	Nov 2017	1.196	Nov 2018	2.236	Nov 2019	-		2.236	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - OGA	MIPR	AMRDEC : AL	20.390	7.432	Nov 2017	7.662	Nov 2018	7.836	Nov 2019	-		7.836	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - UARC	MIPR	GTRI : GA, AL	2.162	1.100	Nov 2017	0.000		0.000		-		0.000	0.000	3.262	0.000
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - UARC2	MIPR	JHU/APL : AL, VA	0.000	1.429	Nov 2017	2.068	Nov 2018	1.857	Nov 2019	-		1.857	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation	MIPR	DTRA : Ft Belvoir VA	0.000	0.500	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
- DTRA - support to construction in Poland															
Land Based SM-3 Site Activation - Site Activation - Poland Admin Communication	MIPR	Northrop Grumman : Poland	0.000	0.285	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation - Poland Base Operating Support	MIPR	NAVFAC : Poland	0.000	3.900	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation - Poland Commercial and Temporary Utilities	MIPR	NAVFAC : Poland	0.000	2.900	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation - Poland Fuel	MIPR	DLA : Fort Belvoir VA	0.000	0.500	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation - Poland Material Handling Services	MIPR	NAVFAC : Naples Italy	0.000	0.130	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation - Transportation of Aegis Weapon System	MIPR	SDDC : Scotts AFB IL	0.000	0.100	Oct 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation - USACE in-house support in Poland	MIPR	CEHNC : Huntsville AL	0.000	0.700	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation - USACE support in Poland	MIPR	CENAU : Poland	0.000	2.300	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Land Based SM-3 Site Activation - Site Activation	C/FFP	Chenega Infinity : Chantilly VA	0.000	8.000	Sep 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency													Date: March 2019		
Appropriation/Budget Activity 0400 / 4							R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD09 / Aegis BMD				

Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
- Poland Security Guards/ Escorts															
Subtotal			2,538.845	285.052		227.223		292.462		-		292.462	Continuing	Continuing	N/A

Remarks
N/A

Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD					Project (Number/Name) MD09 / Aegis BMD					
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2,538.845	285.052		227.223		292.462		-		292.462	Continuing	Continuing	N/A

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, MIPRs, and civilian salaries on the R-3.
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency																Date: March 2019			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)										Project (Number/Name)				
0400 / 4					PE 0603892C / AEGIS BMD										MD09 / Aegis BMD				
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 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024		
BL 5.4 IPR #2					◇														
BMD 6.0 IPR #1					◇														
BMD 5.1 Certification							△												
BMD 6.0 IPR #2							◇												
BL 5.4/BMD 4.x EA								◇											
BL 5.4 SRR								△											
BMD 6.0 IPR #3								◇											
BL 5.3.x/BMD 4.x Certification									☆										
FTX-23 (AEGIS 5.1, DT Target Only Flight Test)									△										
BMD 6.0 IPR #4										◇									
BL 5.4 (BMD 4.2) SRR										◇									
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)										△									
BL 5.4 IPR #1											☆								
BL 5.4 (BMD 4.1) Certification										△									
BMD 6.0 IPR #5											◇								
FTM-30 (AEGIS 5.1, DT/OT Intercept Flight Test)											△								
FTO-03 (OTA, OT Intercept Flight Test)											△								
BL 5.4 (BMD 4.2) IPR #2											☆								
BL 5.1.2 Certification												△							
BL 5.4 (BMD 4.2) IPR #3												◇							
BMD 6.0 EA												◇							
BL 5.4 (BMD 4.2) EA													◇						
BL 5.4 (BMD 4.2) IPR #4													◇						
FTM-38 (AEGIS 5.0, DT/OT Intercept Flight Test)															△				

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency															Date: March 2019														
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD										Project (Number/Name) MD09 / Aegis BMD									
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 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024							
FTM-37 (OT) (AEGIS 5.1, OT Intercept Flight Test)																				△									
BL 5.4 (BMD 4.2) Certification																					◇								
FTX-38 (AEGIS 5.1, DT Target Only Flight Test)																						△							
FTM-40 (AEGIS 5.1, DT/OT Intercept Flight Test)																						△							
FTM-41 (AEGIS 5.1, DT Target Only Flight Test)																							△						

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD09 / Aegis BMD	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BL 5.4 IPR #2	1	2018	1	2018
BMD 6.0 IPR #1	1	2018	1	2018
BMD 5.1 Certification	4	2018	4	2018
BMD 6.0 IPR #2	4	2018	4	2018
BL 5.4/BMD 4.x EA	2	2019	2	2019
BL 5.4 SRR	2	2019	2	2019
BMD 6.0 IPR #3	2	2019	2	2019
BL 5.3.x/BMD 4.x Certification	4	2019	4	2019
FTX-23 (AEGIS 5.1, DT Target Only Flight Test)	4	2019	4	2019
BMD 6.0 IPR #4	1	2020	1	2020
BL 5.4 (BMD 4.2) SRR	1	2020	1	2020
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	2	2020	2	2020
BL 5.4 IPR #1	3	2020	3	2020
BL 5.4 (BMD 4.1) Certification	3	2020	3	2020
BMD 6.0 IPR #5	4	2020	4	2020
FTM-30 (AEGIS 5.1, DT/OT Intercept Flight Test)	4	2020	4	2020
FTO-03 (OTA, OT Intercept Flight Test)	4	2020	4	2020
BL 5.4 (BMD 4.2) IPR #2	4	2020	4	2020
BL 5.1.2 Certification	1	2021	1	2021
BL 5.4 (BMD 4.2) IPR #3	1	2021	1	2021
BMD 6.0 EA	1	2021	1	2021
BL 5.4 (BMD 4.2) EA	3	2021	3	2021
BL 5.4 (BMD 4.2) IPR #4	3	2021	3	2021

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency	Date: March 2019
---	-------------------------

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>	Project (Number/Name) MD09 / <i>Aegis BMD</i>
--	--	---

Events	Start		End	
	Quarter	Year	Quarter	Year
FTM-38 (AEGIS 5.0, DT/OT Intercept Flight Test)	4	2022	4	2022
FTM-37 (OT) (AEGIS 5.1, OT Intercept Flight Test)	1	2023	1	2023
BL 5.4 (BMD 4.2) Certification	4	2023	4	2023
FTX-38 (AEGIS 5.1, DT Target Only Flight Test)	1	2024	1	2024
FTM-40 (AEGIS 5.1, DT/OT Intercept Flight Test)	2	2024	2	2024
FTM-41 (AEGIS 5.1, DT Target Only Flight Test)	3	2024	3	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MG09: Aegis BMD SM-3 Development Articles	-	194.018	120.217	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	314.235
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note Decrease from FY 2019 to FY 2020 reflects the completion of the SM-3 Block IIA FY16 manufacturing contract.												
A. Mission Description and Budget Item Justification This project supported Aegis BMD purchase of Development Articles to use as test articles, and initial deployment in support of EPAA Phase III. Project included manufacturing of SM-3 Block IIA All Up Round (AUR) for the purposes of flight testing and delivery to the fleet as operational assets, and to ensure the maturation of SM-3 Block IIA manufacturing process.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2018	FY 2019	FY 2020	
Title: FY16 SM-3 Block IIA RDT&E All Up Rounds Articles: Description: Manufacture seventeen (17) SM-3 Block IIA All Up Rounds (AURs) (delivered FY 2018 through FY 2020) for the purposes of flight testing as reflected in the IMTP and, if not consumed in testing, delivery to the fleet as operational assets prior to an initial production decision in support of EPAA Phase III. SM-3 Block IIA AURs validate the Engineering Manufacturing Readiness Level 3 criteria for an Initial Production Decision scheduled 4Q FY 2018. Recurring Accomplishment: Deliver SM-3 Block IIA AURs Specific and/or unique accomplishments to each FY are as follows: FY 2019 Plans: Continue manufacturing and deliver of FY16 SM-3 Block IIA RDT&E All Up Rounds deliveries FY 2020 Plans: Complete manufacturing and deliver of FY16 SM-3 Block IIA RDT&E All Up Rounds deliveries FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 reflects the completion of the SM-3 Block IIA FY16 manufacturing contract.									194.018	120.217	0.000	
									-	-	-	
Title: FY18 SM-3 Block IIA RDT&E All Up Rounds Articles:									0.000 -	0.000 -	0.000 -	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019
Description: N/A FY 2019 Plans: N/A FY 2020 Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals		194.018	120.217
C. Other Program Funding Summary (\$ in Millions) N/A <u>Remarks</u> <u>D. Acquisition Strategy</u> The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively. <u>E. Performance Metrics</u> N/A			

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
FY16 SM-3 Block IIA RDT&E All Up Rounds - FY16 SM-3 Block IIA RDT&E All Up Rounds - NSWC/DD	MIPR	NSWC/DD : Dahlgren, VA	0.000	0.145	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
FY16 SM-3 Block IIA RDT&E All Up Rounds - FY16 SM-3 Block IIA RDT&E All Up Rounds - SM-3 MANUFACTURING - MG09	SS/CPAF	Raytheon : Tucson, AZ	0.000	193.873	Nov 2017	118.217	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
FY16 SM-3 Block IIA RDT&E All Up Rounds - FY16 SM-3 Block IIA RDT&E All Up Rounds-Various	MIPR	Various : Various, CA, VA, MD	0.000	0.000		2.000	Apr 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	194.018		120.217		0.000		-		0.000	Continuing	Continuing	N/A
Remarks N/A															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	194.018		120.217		0.000		-		0.000	Continuing	Continuing	N/A
Remarks Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency							Date: March 2019										
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MG09 / Aegis BMD SM-3 Development Articles									
Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●		Complete Activity ◆									
Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○		Planned Activity ◇									
				FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024	
FY16 SM-3 Block IIA AUR-first round delivery								◇									
FY16 SM-3 Block IIA AUR EPAA Phase III Declaration								◇									

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>	Project (Number/Name) MG09 / <i>Aegis BMD SM-3 Development Articles</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FY16 SM-3 Block IIA AUR-first round delivery	4	2019	4	2019
FY16 SM-3 Block IIA AUR EPAA Phase III Declaration	3	2020	3	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MM09 / Aegis BMD SM-3 Development			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MM09: Aegis BMD SM-3 Development	-	117.179	161.958	232.714	-	232.714	162.708	143.663	14.672	18.509	0.000	851.403
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2019 to FY 2020 provides for increased GEU Activities (manufacturing readiness review for custom electronic parts and verify unit is production ready; GEU re-qualification; Computer in the Loop (CIL) and Hardware in the Loop (HIL); and transition GEU upgrades into current production lines), and completion of manufacturing maturity (EMRL 4).

A. Mission Description and Budget Item Justification

Provides development of SM-3 Missiles, Upgrade Modifications, and Integration into the Aegis Weapon System.

The SM-3 Block IB improves Aegis BMD's ability to expand the BMD battlespace, engage longer range, more sophisticated ballistic missiles that may deploy countermeasures and launch in larger raid sizes. The SM-3 Block IB Kinetic Warhead's (KW) two color infra-red (IR) seeker and advanced signal processor provides a real-time discrimination and characterization capability while improving sensitivity for longer range targets and performance against more sophisticated threats. Additionally, the new Throttleable Divert and Attitude Control System (TDACS) KW divert engine has been upgraded over the SM-3 Block IA to provide a more flexible divert in order to maneuver the KW to intercept.

The SM-3 Block IIA consists of an upgrade to a 21-inch diameter SM-3 missile and expands beyond the SM-3 Block IB battlespace to counter Intermediate Range Ballistic Missile (IRBM). SM-3 Block IIA provides an increased kinematic envelope through improved infra-red (IR) discrimination and divert capability that provide performance against the EPAA phase III expanded threat set. When combined with Aegis BMD 5.1 weapon system modifications, the SM-3 Block IIA will provide Engage on Remote (EoR) capability, which allows the use of remote off board sensor information to launch and guide the SM-3 Block IIA to final intercept. Aegis BMD 5.1 EoR capability with SM-3 Block IIA also frees up Radar resources and increases the number and type of threats to be engaged simultaneously over previous baselines.

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

	FY 2018	FY 2019	FY 2020
Title: Standard Missile-3 (SM-3) Block IB Development	17.554	49.259	34.611
Articles:	-	-	-
Description: This effort develops and modernizes the SM-3 Block IB missile, which improves on the SM-3 Block IA performance and enables engagement of more sophisticated ballistic missiles and larger raid sizes. SM-3 Block IB Modernization will provide the following upgrades: - Upgraded SM-3 KW Common Avionics Package will provide improved producibility and reduced cost resulting from utilization of common components between SM-3 Block IIA and the Redesigned Kill Vehicle (RKV). SM-3 Block IB Common Components			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD		Project (Number/Name) MM09 / Aegis BMD SM-3 Development	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2019	FY 2020
<p>will be extendable to support different form/fit in circuit card assemblies across SM-3 Block IB, SM-3 Block IIA, and RKV and will mitigate SM-3 Block IB hardware availability issues.</p> <ul style="list-style-type: none"> - Upgraded SM-3 Block IB Guidance Section (GS) will resolve Computer Processing Unit 3 and Plate 3A hardware availability issues, enable use of 5.1/IIA Target Object Map (TOM) and similar software to SM-3 Block IIA Mission Computer; and enable additional capability against complex threats. - Continue development of the upgraded SM-3 Block IB Guidance Section (GS) <p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Assess performance with weapons systems upgrades/modifications and against emerging threats <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Complete detailed design of the KW Common Avionics Package - Initiate development of common KW Circuit Card Assembly <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> - Continue development of common KW Circuit Card Assembly - Initiate Guidance Section changes to support Dual - Band Data Link (DDL) integration and M-Code GPS compatibility <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p> <p>Decrease from FY 2019 to FY 2020 reflects resolved hardware availability issues and increased commonality within the SM-3 Missile family with utilization of previous material acquisitions of KW and GS.</p>					
<p>Title: Standard Missile-3 (SM-3) Block IIA Development</p> <p align="right">Articles:</p> <p>Description: The SM-3 Block IIA is required to meet EPAA Phase III. It will increase the area that can be defended by Aegis BMD, increase the probability of kill against a larger threat set, and leverage enhanced capability provided by BMDS sensor upgrades.</p> <p>Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Conduct SM-3 Block IIA software update to support engagements against additional complex threats identified during Aegis BMD 5.1 design process conducted after missile Critical Design Review (CDR) - Conduct End to End Distributed Development System (ETEDDS) integration testing; and flight test support - Continue implementation of SM-3 Block IIA cost reduction initiatives to support meeting cost goals to reduce the current estimated Average Unit Production Price (AUPP) - Continue transition of KW hardware commonality effort (from design to material purchases) to system integration testing in order to demonstrate technology readiness level 7 - Continue Engineering Manufacture Readiness Level (EMRL) 3 compliance to support life cycle progression 			99.625 -	112.699 -	198.103 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019
Specific and/or unique accomplishments to each FY are as follows:			
<p><i>FY 2019 Plans:</i></p> <ul style="list-style-type: none"> - Conduct Non-Recurring Engineering (NRE) services and materials to increase factory build and test capacity to sustain a rate capability of up to two SM-3 Block IIAs per month. <p><i>FY 2020 Plans:</i></p> <ul style="list-style-type: none"> - Complete NRE services for manufacturing maturity (EMRL 4) inclusive of rate capability and production test equipment - Guidance Electronics Unit (GEU) Engineering Change Proposal (ECP) planned activities: - Conduct manufacturing readiness review for custom electronic part and verify unit is production ready - Complete upgraded GEU re-qualification activities and ensure readiness for production - Complete Computer in the Loop (CIL) and Hardware in the Loop (HIL) upgrades; upgrade Technical Design Agent's GEU equipment for flight test simulations - Complete the Engineering Change Proposal, including the technical data package and supporting documentation, for cut-in to missile production - Execute activities to transition GEU upgrades into current production line <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i></p> <p>Increase from FY 2019 to FY 2020 provides for increased GEU ECP activities (as reflected in FY 2020 base plans) to incorporate into current production line.</p>			
Accomplishments/Planned Programs Subtotals		117.179	161.958
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively.			
E. Performance Metrics			
N/A			

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MM09 / Aegis BMD SM-3 Development					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09	SS/CPAF	Raytheon : Tuscon, AZ	0.000	13.832	Jan 2018	42.360	Dec 2018	28.959	Dec 2019	-		28.959	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09 - 20117142332259	MIPR	NSWC/PHD : Port Hueneme, CA	0.000	0.085	Nov 2017	0.246	Nov 2018	0.660	Nov 2019	-		0.660	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09 - Various	MIPR	NSWC Corona : Corona, CA	0.000	2.747	Nov 2017	0.343	Nov 2018	0.790	Nov 2019	-		0.790	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development-MM09 DD	MIPR	NSWC Dahlgren : Dahlgren, VA	0.000	0.341	Nov 2017	1.415	Nov 2018	1.612	Nov 2019	-		1.612	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development-MM09 JHU/APL	SS/CPAF	JHUAPL : Laurel, MD	0.000	0.549	Nov 2017	2.746	Nov 2018	0.420	Nov 2019	-		0.420	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development-MM09-NAVSEA	MIPR	NAVSEA BAE Systems : Baltimore, MD	0.000	0.000		2.149	Nov 2018	2.170	Nov 2019	-		2.170	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - CA,VA, MD	MIPR	Various : CA, VA, MD	0.000	3.338	Nov 2017	3.202	Nov 2018	6.281	Nov 2019	-		6.281	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development -	SS/CPIF	Raytheon : Tucson, AZ	0.000	76.521	Nov 2017	96.570	Apr 2019	159.827	Apr 2020	-		159.827	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MM09 / Aegis BMD SM-3 Development					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA INTEGRATION															
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA INTEGRATION - APL	MIPR	JHU/APL : Laurel, MD	0.000	5.378	Nov 2017	6.514	Dec 2018	15.890	Dec 2019	-		15.890	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA INTEGRATION - DD	MIPR	NSWC DD : Dahlgren, VA	0.000	6.466	Nov 2017	4.258	Nov 2018	9.485	Nov 2019	-		9.485	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NSWC Corona	MIPR	NSWC Corona : Corona, CA	0.000	2.794	Nov 2017	1.057	Nov 2018	4.698	Nov 2019	-		4.698	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NSWC/Crane	MIPR	NWSC/Crane : IN	0.000	0.907	Nov 2017	1.098	Nov 2018	1.922	Nov 2019	-		1.922	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NJ	C/CPFF	Lockheed Martin : Moorestown NJ	0.000	4.221		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	117.179		161.958		232.714		-		232.714	Continuing	Continuing	N/A
Remarks N/A															

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency											Date: March 2019			
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MM09 / Aegis BMD SM-3 Development					
		Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	117.179		161.958		232.714		-		232.714	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency														Date: March 2019										
Appropriation/Budget Activity					R-1 Program Element (Number/Name)										Project (Number/Name)									
0400 / 4					PE 0603892C / AEGIS BMD										MM09 / Aegis BMD SM-3 Development									
Significant Event Complete ▲					Milestone Decision Complete ★					Element Test Complete ◆					System Level Test Complete ●					Complete Activity ◆				
Significant Event Planned △					Milestone Decision Planned ☆					Element Test Planned ◇					System Level Test Planned ○					Planned Activity ◇				
					FY 2018		FY 2019			FY 2020			FY 2021			FY 2022			FY 2023			FY 2024		
Kinetic Warhead hardware commonality (also known as Guidance Electronic Unit Engineering Change Proposal (GEU ECP)) CDR					◇																			
GEU ECP Host GEU delta-CDR								◇																
GEU ECP Qualification										◇														
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)											△													
FTM-30 (AEGIS 5.1, DT/OT Intercept Flight Test)												△												
FTO-03 (OTA, OT Intercept Flight Test)												△												
FTM-38 (AEGIS 5.0, DT/OT Intercept Flight Test)																△								
FTM-37 (OT) (AEGIS 5.1, OT Intercept Flight Test)																		△						
FTX-38 (AEGIS 5.1, DT Target Only Flight Test)																				△				
FTM-40 (AEGIS 5.1, DT/OT Intercept Flight Test)																					△			
FTM-41 (AEGIS 5.1, DT Target Only Flight Test)																						△		

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MM09 / Aegis BMD SM-3 Development	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Kinetic Warhead hardware commonality (also known as Guidance Electronic Unit Engineering Change Proposal (GEU ECP)) CDR	1	2018	1	2018
GEU ECP Host GEU delta-CDR	1	2019	1	2019
GEU ECP Qualification	1	2020	1	2020
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	2	2020	2	2020
FTM-30 (AEGIS 5.1, DT/OT Intercept Flight Test)	4	2020	4	2020
FTO-03 (OTA, OT Intercept Flight Test)	4	2020	4	2020
FTM-38 (AEGIS 5.0, DT/OT Intercept Flight Test)	4	2022	4	2022
FTM-37 (OT) (AEGIS 5.1, OT Intercept Flight Test)	1	2023	1	2023
FTX-38 (AEGIS 5.1, DT Target Only Flight Test)	1	2024	1	2024
FTM-40 (AEGIS 5.1, DT/OT Intercept Flight Test)	2	2024	2	2024
FTM-41 (AEGIS 5.1, DT Target Only Flight Test)	3	2024	3	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MC09 / Cyber Operations			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MC09: Cyber Operations	5.226	2.718	10.886	10.827	-	10.827	11.748	10.679	9.165	10.816	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Sustain the DoD RMF Certification and Accreditation process and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Systems Security Manager (PM/ISSM).

This project supports the monitoring and tracking of Cybersecurity mitigation detailed in Information Technology Security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Authorizing Official (AO). Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the AB mission and non-mission systems, which includes test and remote site administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

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

	FY 2018	FY 2019	FY 2020
Title: Network / System Certification and Accreditation (C&A)	2.718	10.886	10.827
Articles:	-	-	-
<p>Description: This accomplishment has reoccurring efforts. Conduct cybersecurity engineering and architecture requirements planning or Aegis BMD systems. Plan and test the Risk Management Framework (RMF) controls for the BMDS in regards to Aegis BMD systems to comply with new directive, RMF for DoD Information Technology (DoDi 8510.01) to replace the DoD Information Assurance Certification and Accreditation process (DIACAP). In addition, conduct Controls Validation Testing (CVT). Recurring Accomplishments:</p> <ul style="list-style-type: none"> - Continue coordination and development of new and existing accreditation packages that comply with new directive, RMF for DoD Information Technology (DoDi 8510.01) process - Conduct regular Controls Validation Testing (CVT) and cooperative risk assessments to mitigate cybersecurity deficiencies - Develop and deploy Hardware and Software HW/SW implementation strategies for Continuous Monitoring activities at remote sites and Aegis BMD assets <p>Monthly reviews of systems through the eMass</p> <ul style="list-style-type: none"> - Daily management of eMass System Plan of Action and Milestones (POAMs) <p>Specific and/or unique accomplishments to each FY are as follows:</p> <ul style="list-style-type: none"> - Daily management of eMass System Plan of Action and Milestones (POAMs) <p>FY 2019 Plans:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD					Project (Number/Name) MC09 / Cyber Operations		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)										FY 2018	FY 2019	FY 2020
- SEE ABOVE.												
FY 2020 Plans: -SEE ABOVE												
FY 2019 to FY 2020 Increase/Decrease Statement: N/A												
Accomplishments/Planned Programs Subtotals										2.718	10.886	10.827
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• 0603882C: Ballistic Missile Defense Midcourse Defense Segment	1,153.263	803.359	1,156.506	-	1,156.506	829.451	766.237	834.533	776.671	Continuing	Continuing	
• 0603884C: Ballistic Missile Defense Sensors	290.289	385.375	283.487	-	283.487	296.098	263.681	276.092	351.607	Continuing	Continuing	
• 0603896C: Ballistic Missile Defense Command and Control, Battle Management & Communication	449.985	507.817	564.206	-	564.206	534.988	502.581	525.742	535.636	Continuing	Continuing	
• 0603898C: Ballistic Missile Defense Joint Warfighter Support	48.574	48.767	51.532	-	51.532	51.411	53.932	53.600	54.646	Continuing	Continuing	
• 0603904C: Missile Defense Integration and Operations Center (MDIOC)	51.905	58.125	56.161	-	56.161	57.446	58.574	61.144	62.339	Continuing	Continuing	
• 0604878C: Aegis BMD Test	128.757	92.160	169.822	-	169.822	76.270	149.764	137.058	147.923	Continuing	Continuing	
• 0604880C: Land Based SM-3 (LBSM3)	29.652	27.692	38.352	-	38.352	36.348	28.029	22.733	30.463	Continuing	Continuing	
• 0604881C: AEGIS SM-3 Block IIA Co-Development	9.531	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.531	
• 0901598C: Management HQ - MDA	29.947	28.626	27.065	-	27.065	27.446	28.164	28.698	29.271	Continuing	Continuing	
Remarks												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / <i>AEGIS BMD</i>	Project (Number/Name) MC09 / <i>Cyber Operations</i>
<p><u>D. Acquisition Strategy</u> Full and Open contract support through Missile Defense Agency Program Management Office.</p> <p><u>E. Performance Metrics</u> N/A</p>		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MC09 / Cyber Operations					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Network / System Certification and Accreditation (C&A) - BOOZ ALLEN HAMILTON INC	C/CPIF	MDA : MCLEAN, VA	3.476	1.459	Nov 2017	2.680	Nov 2018	4.000	Nov 2019	-		4.000	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services	C/CPIF	Torch Technologies : Huntsville, AL	1.750	0.416		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation	SS/CPAF	Lockheed Martin : Moorestown NJ	0.000	0.843		6.405	Nov 2018	6.827	Nov 2019	-		6.827	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation - PHD	MIPR	NSWC/PHD : Port Hueneme CA	0.000	0.000		0.501	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Network/System Certification and Accreditation - DD	MIPR	NSWC - DD : Dahlgren VA	0.000	0.000		1.300	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			5.226	2.718		10.886		10.827		-		10.827	Continuing	Continuing	N/A
Remarks N/A															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			5.226	2.718		10.886		10.827		-		10.827	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency							Date: March 2019		
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD		Project (Number/Name) MC09 / Cyber Operations			
	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Remarks Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.									

UNCLASSIFIED

PE 0603892C: AEGIS BMD
Missile Defense Agency

UNCLASSIFIED
Page 46 of 66

R-1 Line #80

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MC09 / Cyber Operations

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC09 Cyber Operations	1	2018	4	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MX09 / Aegis BMD Development Support			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MX09: Aegis BMD Development Support	190.248	157.811	185.742	163.628	-	163.628	172.649	182.454	170.658	182.767	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note												
Decrease from FY 2019 to FY 2020 reflects the following:												
- Transition of Common Source Library (CSL), BMD 5.0 CU software maintenance, and transition of Test Site Usage for in-service baselines from RDT&E to O&M												
- Transition of test related program management costs from this PE to PE 0604878C Aegis Test to ensure continued transparency and program efficiency												
A. Mission Description and Budget Item Justification												
Aegis Ballistic Missile Defense (BMD), in accordance with negotiated agreements between the U.S. Navy and the Missile Defense Agency (MDA) has identified and segregated funding for Developmental Support of Aegis BMD specific elements resident aboard Aegis capable U.S. Navy ships. Computer Program Support consists of, but is not limited to, reviews of Technical Observation Reports (TORs) that are generated by ship crews during exercises or deployments, determination of root causes and preparation of Computer Program Change Request (CPCR) to correct TORs, updates to the in-service computer program to apply, test and certify multiple CPCRs, and tests installation of Aegis Weapon System (AN/SPY-radar/Fire Control System (FCS)) alignment updates as required. Aegis BMD provides support to Annual Integration Events (AIEs) to ensure any updated Aegis Combat System (ACS) computer programs do not degrade BMD equipped ships and provides distance and technical support for BMD equipped ships.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2018	FY 2019	FY 2020	
Title: Fleet Integration									9.257	15.395	16.871	
									Articles: -	-	-	
Description: Provide Fleet operations and mission support to enable the conduct of sustained BMD operations; advocate war fighter requirements and fleet feedback in baseline development and capability upgrades to Aegis BMD weapon system; provide analysis and Mission Planning support for Geographic Combatant Commanders for operational application of Maritime BMD capabilities; and provide BMD Capabilities Analysis and Exercise Support for Aegis BMD baselines under development or currently deployed in the Operational Fleet. Deliver Aegis BMD Mission Planner Prototype (Cerberus). Recurring Accomplishments: - Define, develop and review Joint and Fleet Doctrine for incorporation of Aegis BMD capability transition to warfighter and baseline acceptance into MDA Operational Capacity Baseline (OCB) - Research and define certification and warfighter acceptance requirements for Aegis BMD baselines to ensure successful capability delivery - Develop Aegis BMD training simulations and scenarios to support shipboard training including BMD Qualification (BMDQ) and higher level exercises												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020
<div>- Execute warfighter feedback process to enhance Aegis BMD functional capability development and influence future Aegis BMD requirements and support MDA Test Community and Combatant Commanders in BMD Exercises and Wargames</div> <div>- Provide analysis for Anti-Ship Ballistic Missile Defense</div> <div>- Provide analysis on parametric organic sensor sensitivity</div> <div>- Provide analysis on up-range ship/sensor support for LoR, EoR, and Cued engagements</div> <div>- Provide analysis on impacts of countermeasures</div> <div>- Provide analysis on developing threats</div> <div>Specific and/or unique accomplishments to each FY are as follows:</div> <div>FY 2019 Plans:</div> <div>- Optimization of multi-baseline/ship defense designs</div> <div>- Limited anti-air warfare depth of fire calculations</div> <div>- Real-time mission planning for COCOMs and fleet components to facilitate regional defense design laydowns</div> <div>FY 2020 Plans:</div> <div>- Deliver Aegis BMD Mission Planner Prototype</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:</div> <div>N/A</div>				
<div>Title: Infrastructure Upgrades</div> <div>Articles:</div> <div>Description: Provides management of C4I aspects of the BMDS Test Site (BTS) San Diego upgrade plan to maintain Fleet representative C4I configurations to support testing, troubleshooting, and Fleet operations. Special Access Program (SAP) facility upgrades inclusive of labor for Contractor Program Security Officers, Information Assurance Officers, and System Administrators that will oversee the associated development activities and data transfer efforts. Funds IT services in support of the Aegis RDT&E mission to include: IT help-desk services; portal and data services; records management; business automation services; and desktop and Special Purpose Processing Nodes (SPPNs) maintenance and licenses. In addition, funds will be used to replace critical IT infrastructure at end-of-life and to implement DoD mandated projects in support of the Joint Information Environment (JIE) initiative.</div> <div>Recurring Accomplishments:</div> <div>- Transfer necessary data between collateral and SAP environments to comply with Federal and DoD mandates (Cybersecurity and Joint Information Environment)</div> <div>- Configuration and data management to ensure Modeling and Simulation (M&S) and software builds are identical in collateral and SAP environment</div>		22.336 -	25.297 -	24.332 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2019	FY 2020
<div>- Fund Aegis IT services such as IT help-desk services; portal and data services; records management; business automation services; and desktop and SPPN maintenance and licenses.</div> <div>- Fund critical end-of-life IT equipment replacements</div> <div>- Fund IT infrastructure upgrade planning and implementation efforts to accomplish DoD mandated IT projects (JIE and DoD CIO Information Resources Management (IRM) initiatives)</div> <div>- Implement and maintain Fleet representative C4I configurations to support testing, troubleshooting, and Fleet operations</div> <div>Specific and/or unique accomplishments to each FY are as follows:</div> <div>FY 2019 Plans:</div> <div>- SEE ABOVE.</div> <div>FY 2020 Plans:</div> <div>- SEE ABOVE.</div> <div>FY 2019 to FY 2020 Increase/Decrease Statement:</div> <div>N/A</div>					
<div>Title: Aegis Ballistic Weapon System Support</div> <div>Articles:</div> <div>Description: Provides system engineering for fielded Aegis BMD Weapon Systems from warfighter feedback, investigation of BMDS Discrepancy Reports, and BMDS ground test observation analysis. It includes computer program defect corrections and supports assessment of flight test readiness.</div> <div>Recurring Accomplishments:</div> <div>- Update threat adaptation data to keep pace with emergent threats</div> <div>- Provide operation and maintenance of land based test sites used for the development of Aegis BMD baselines. Operation and maintenance includes Quality Assurance, Configuration Management and other support activities to both baseline development and the sites. Engineering, logistic, quality assurance, configuration management and administrative support for the operation and maintenance of the Aegis shore sites and centers in support of the delivery of BMD baselines</div> <div>- Provide support for contingency operations of National interest</div> <div>- Support the fielded Aegis BMD computer programs baselines approved as an Operational Capability Baseline</div> <div>- Provide engineering support to Operationally Capable Baseline ships that participate in BMD test events</div> <div>- Provide test site usage for maintenance and support of baselines under development</div> <div>- Sustain the classified computing infrastructure</div> <div>Specific and/or unique accomplishments to each FY are as follows:</div> <div>FY 2019 Plans:</div>			21.698 -	37.613 -	22.747 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020
- SEE ABOVE. FY 2020 Plans: - SEE ABOVE. FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 reflects the transition of Common Source Library (CSL), BMD 5.0CU software maintenance, and Test Site Usage for in-service baselines from RDT&E to O&M				
Title: Program Operations Articles: Description: This activity funds the Government, contractor, and Federally Funded Research and Development Center (FFRDC) workforce that manage the overall Aegis Ballistic Missile Defense (BMD) program and enables the program to develop, build, and test standard missiles and the associated Aegis Weapon Systems. This project includes all operations support for the Aegis program office in Engineering, Testing, Logistics, Acquisition, Safety, Quality Assurance, Finance, Budget Formulation and Execution, Cost Estimation, and Earned Value Management in support of development activities. Specific and/or unique accomplishments to each FY are as follows: FY 2019 Plans: - SEE ABOVE. FY 2020 Plans: - SEE ABOVE. FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 reflects transition of test related program management costs from this PE to PE 0604878C Aegis Test to ensure continued transparency and program efficiency		102.420 -	104.737 -	99.678 -
Title: United States Forces Korea (USFK) Joint Emergent Operational Needs Statement (JEONS) Articles: Description: Integrated upper tier Ballistic Missile Defense System that expands engagement options and increases coverage area. Provides updated Threat Adaptation Data necessary for successful mission planning and threat detection on Aegis BMD ships. JEON funding also supports initial development efforts for regional peer-to-peer engagement coordination with Terminal High-Altitude Area Defense (THAAD). FY 2019 Plans:		2.100 -	2.700 -	0.000 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency								Date: March 2019			
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MX09 / Aegis BMD Development Support			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020	
Deliver an integrated upper tier Ballistic Missile Defense System that expands engagement options and increases coverage area.											
FY 2020 Plans: N/A											
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 reflects no FY 2020 requirements											
Accomplishments/Planned Programs Subtotals								157.811	185.742	163.628	
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 0604878C: Aegis BMD Test	128.757	92.160	169.822	-	169.822	76.270	149.764	137.058	147.923	Continuing	Continuing
• 0604880C: Land Based SM-3 (LBSM3)	29.652	27.692	38.352	-	38.352	36.348	28.029	22.733	30.463	Continuing	Continuing
• 0604881C: AEGIS SM-3 Block IIA Co-Development	9.531	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.531
Remarks											
D. Acquisition Strategy											
The Aegis Ballistic Missile Defense (BMD) element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDs capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Aegis BMD program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the Standard Missile-3 (SM-3) and the Aegis BMD Weapon System, respectively.											
Competition will be maximized for purchase of any products or services as appropriate.											
E. Performance Metrics											
N/A											

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MX09 / Aegis BMD Development Support					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A
Remarks N/A															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Fleet Integration - MX09 - Fleet APL	C/CPAF	JHU/APL/MD : Columbia, MD	12.750	4.746	Nov 2017	8.085	Nov 2018	11.130	Nov 2019	-		11.130	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet DD	MIPR	NSWC DD : Dahlgren, VA	4.786	2.979	Nov 2017	2.938	Nov 2018	5.081	Nov 2019	-		5.081	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet PHD	MIPR	NSWC PHD : Port Huenmene	0.432	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet SMDC	MIPR	SMDC/ARSTRST : Huntsville, AL	0.837	0.468	Nov 2017	0.639	Nov 2018	0.660	Nov 2019	-		0.660	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet CSCS	MIPR	CSCS : Dahlgren, VA	2.096	1.064	Nov 2017	1.053	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Fleet Integration - MX09- Fleet System Engineering Group	C/CPFF	System Engineering Group : Laurel, MD	0.000	0.000		2.680	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - ICT Funding	C/CPAF	Jacobs Engineering : AL,CA,CO,NM,VA,HI	21.603	13.282	Nov 2017	12.911	Nov 2018	11.569	Nov 2019	-		11.569	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S	MIPR	SPAWAR : CA	0.000	0.191	Nov 2017	0.255	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S APL	SS/CPAF	JHU/APL : Laurel, MD	1.050	0.447	Nov 2017	0.250	Nov 2018	5.160	Nov 2019	-		5.160	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S Corona	MIPR	NSWC Corona : Corona, CA	1.630	1.158	Nov 2017	1.203	Nov 2018	0.847	Nov 2019	-		0.847	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S LM	C/CPAF	Lockheed Martin : Moorestown, NJ	11.238	3.670	Nov 2017	3.375	Nov 2018	0.894	Nov 2019	-		0.894	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MX09 / Aegis BMD Development Support					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Infrastructure Upgrades - MX09 - S MIT	C/CPAF	MIT : Lexington, MA	0.320	0.338	Nov 2017	0.300	Nov 2018	0.348	Nov 2019	-		0.348	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S RMS	C/CPAF	Raytheon : Tucson, AZ	5.820	0.000		0.830	Nov 2018	1.100	Nov 2019	-		1.100	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09- D/TD	MIPR	SPAWAR : CA	3.598	1.497	Nov 2017	4.853	Nov 2018	3.294	Nov 2019	-		3.294	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09- S DD	MIPR	NSWC DD : Dahlgren, VA	2.319	0.994	Nov 2017	0.525	Nov 2018	0.300	Nov 2019	-		0.300	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09-Various	MIPR	Various : Various	0.000	0.759		0.795	Nov 2018	0.820	Nov 2019	-		0.820	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW APL	SS/CPFF	JHU/APL : Columbia, MD	4.682	0.445	Nov 2017	1.182	Nov 2018	0.853	Nov 2019	-		0.853	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW DD	MIPR	NSWC DD : Dahlgren, VA	18.051	0.077	Nov 2017	3.946	Nov 2018	3.618	Nov 2019	-		3.618	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW LM	C/CPFF	Lockheed Martin : Moorestown, NJ	30.879	10.526	Nov 2017	8.373	Nov 2018	2.098	Nov 2019	-		2.098	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW NAVSEA	MIPR	NAVSEA : Washington, DC	32.145	9.316	Nov 2017	22.450	Nov 2018	15.372	Nov 2019	-		15.372	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW SSCPAC	MIPR	SPAWAR : San Diego, CA	2.390	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW TECH REP	MIPR	Aegis Tech Rep : Moorestown, NJ	0.849	0.091	Nov 2017	0.432	Nov 2018	0.432	Nov 2019	-		0.432	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW Wallops	MIPR	SCSC : Wallops Island, VA	2.000	1.243	Nov 2017	0.374	Nov 2018	0.374	Nov 2019	-		0.374	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - D	MIPR	MDA : Arlington, VA	1.037	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MX09 / Aegis BMD Development Support					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Ballistic Weapon System Support - MX09 - IH	MIPR	NSWC Indian Head : MD	0.249	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - Raytheon	SS/CPAF	Raytheon : AZ	5.644	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD JHU/APL	SS/CPFF	JHU/APL : Columbia, MD	2.554	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD MITRE	MIPR	CECOM - MITRE : Dahlgren, VA	2.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD NSWC DD	MIPR	NSWC DD : Dahlgren, VA	1.833	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD PHD	MIPR	NSWC PHD : Port Hueneme, CA	0.557	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD SSCPAC	MIPR	SPAWAR : San Diego, CA	11.826	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD Various	MIPR	Various : San Diego, CA	4.573	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW PHD	MIPR	NSWC PHD : Port Hueneme, CA	0.500	0.000		0.856	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09-AW MIT/LL	MIPR	Hanscom, AFB : Lexington, MA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09-AW Various	MIPR	Various : MD, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MX09 / Aegis BMD Development Support					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Operations - Program Operations - MD09 - Civ Sal	MIPR	MDA : Arlington, VA	0.000	33.575	Nov 2017	35.750	Nov 2018	36.417	Nov 2019	-		36.417	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - DD PM	MIPR	NSWC DD : Dahlgren, VA	0.000	4.932	Nov 2017	3.186	Nov 2018	3.186	Nov 2019	-		3.186	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - IT	MIPR	MDA : Arlington, VA	0.000	1.402	Nov 2017	1.752	Nov 2018	1.752	Nov 2019	-		1.752	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - MDA Travel	MIPR	MDA : Arlington, VA	0.000	2.165	Nov 2017	3.958	Nov 2018	3.483	Nov 2019	-		3.483	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - MIDAESS	MIPR	MDA : Arlington, VA	0.000	40.197	Nov 2017	38.448	Nov 2018	33.878	Nov 2019	-		33.878	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - NAVSEA Civ Sal	MIPR	NAVSEA : Washington, DC	0.000	13.691	Nov 2017	15.466	Nov 2018	14.785	Nov 2019	-		14.785	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - NAVSEA RB Sal	MIPR	NAVSEA : Washington, DC	0.000	2.225	Nov 2017	2.499	Nov 2018	2.499	Nov 2019	-		2.499	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - NAVSEA Training, Various	MIPR	NAVSEA : Washington, DC	0.000	1.526	Nov 2017	0.297	Nov 2018	0.297	Nov 2019	-		0.297	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - NAVSEA Travel	MIPR	NAVSEA : Washington, DC	0.000	1.056	Nov 2017	0.659	Nov 2018	0.659	Nov 2019	-		0.659	Continuing	Continuing	Continuing
Program Operations - Program Operations - MD09 - Security	MIPR	Various VA : VA	0.000	1.651	Nov 2017	2.722	Nov 2018	2.722	Nov 2019	-		2.722	Continuing	Continuing	Continuing
United States Forces Korea (USFK) Joint Emergent Operational Needs Statement (JEONS)	SS/CPFF	JHU/APL : Columbia, MD	0.000	0.480	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD						Project (Number/Name) MX09 / Aegis BMD Development Support			
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
- United States Forces Korea (USFK) - MX09 AW JHU/APL															
United States Forces Korea (USFK) Joint Emergent Operational Needs Statement (JEONS) - United States Forces Korea (USFK) - MX09 AW Lockheed Martin	C/CPFF	Lockheed Martin : Moorestown, NJ	0.000	0.935	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
United States Forces Korea (USFK) Joint Emergent Operational Needs Statement (JEONS) - United States Forces Korea (USFK) - MX09 AW MIT/LL	MIPR	MIT/LL : Lexington, MA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
United States Forces Korea (USFK) Joint Emergent Operational Needs Statement (JEONS) - United States Forces Korea (USFK) - MX09 AW NSWC	MIPR	NSWC DD : Dahlgren, VA	0.000	0.685	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
United States Forces Korea (USFK) Joint Emergent Operational Needs Statement (JEONS) - United States Forces Korea (USFK) - MX09 AW Various	MIPR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
United States Forces Korea (USFK) Joint Emergent Operational Needs Statement (JEONS) - United States Forces Korea (USFK)-AW	SS/CPAF	LM : LM	0.000	0.000		2.700	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency													Date: March 2019		
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MX09 / Aegis BMD Development Support					

Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			190.248	157.811		185.742		163.628		-		163.628	Continuing	Continuing	N/A

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			190.248	157.811		185.742		163.628		-		163.628	Continuing	Continuing	N/A

Remarks
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency														Date: March 2019															
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD										Project (Number/Name) MX09 / Aegis BMD Development Support									
Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆													
Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇													
										FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024							
MX09 Aegis BMD Development Support										◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇						

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MX09 / Aegis BMD Development Support	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MX09 Aegis BMD Development Support	1	2018	4	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD40 / Program-Wide Support			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MD40: Program-Wide Support	272.991	41.617	35.050	27.848	-	27.848	29.983	30.272	25.810	27.634	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

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 personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

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

	FY 2018	FY 2019	FY 2020
Title: Program Wide Support	41.617	35.050	27.848
Articles:	-	-	-
<p>Description: 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 personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.</p>			
FY 2019 Plans:			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD40 / Program-Wide Support	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019
- SEE ABOVE. FY 2020 Plans: - SEE ABOVE. FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 reflects the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals		41.617	35.050
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy N/A E. Performance Metrics NA			

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD				Project (Number/Name) MD40 / Program-Wide Support					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Facilities and Maintenance SRM (MIPR)	MIPR	Various : Multi: AL, CO, CA, VA, AK	1.394	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	1.886	0.816	Jul 2018	0.537	Jul 2019	0.423	Jul 2020	-		0.423	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations User Services	C/CPAF	Various/Multi: AL, CA, CO, : NM, VA, various	0.623	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries	Allot	MDA : Multi: AK, AL, CO, CA, VA	199.075	37.906	Nov 2017	34.513	Oct 2018	25.547	Oct 2019	-		25.547	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK/AL/CA/CO/HI/MD/VA/NJ/NY/OCONUS	30.979	0.000		0.000		0.152	Jan 2020	-		0.152	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	36.361	2.895	Aug 2018	0.000		1.726	Jul 2020	-		1.726	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support, International, and materiel and Readiness	MIPR	Naval Surface Warfare Center : AL, VA	1.616	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	MIPR	Various : Multi: AL, CA, CO, VA	1.057	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			272.991	41.617		35.050		27.848		-		27.848	Continuing	Continuing	N/A
Remarks N/A															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			272.991	41.617		35.050		27.848		-		27.848	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency							Date: March 2019			
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD			Project (Number/Name) MD40 / Program-Wide Support				
	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency														Date: March 2019															
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD										Project (Number/Name) MD40 / Program-Wide Support									
Significant Event Complete ▲					Milestone Decision Complete ★					Element Test Complete ◆					System Level Test Complete ●					Complete Activity ◆									
Significant Event Planned △					Milestone Decision Planned ☆					Element Test Planned ◇					System Level Test Planned ○					Planned Activity ◇									
										FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024							
MD40 Program-Wide Support										◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / AEGIS BMD	Project (Number/Name) MD40 / Program-Wide Support	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2018	4	2024