Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	4,234.517	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
MD09: *Aegis BMD*	3,034.373	285.313	361.441	437.453	-	437.453	-	-	-	-	-	-
MM09: *Aegis BMD SM-3 Development*	302.386	243.194	307.970	124.708	-	124.708	-	-	-	-	-	-
MC09: *Cyber Operations*	20.949	16.455	29.392	3.750	-	3.750	-	-	-	-	-	-
MX09: *Aegis BMD Development Support*	527.151	151.772	148.030	136.506	-	136.506	-	-	-	-	-	-
MD40: *Program-Wide Support*	349.658	25.848	30.503	30.095	-	30.095	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects the reduction of development activities including the Guidance Electronics Unit(GEU) Engineering Change Proposal(ECP)and Software Upgrade (SWUP) build 8 and incorporation into the production line; completion of the Ballistic Missile Defense (BMD) 4.2 major development functionality and the BMD 5.1.3 Capability upgrade

A. Mission Description and Budget Item Justification

The Sea-Based Weapon Systems 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 Missile Defense System (MDS) upgrades. The Sea-Based Weapon Systems element of the MDS capitalizes upon and evolves from the existing United States Navy Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures. Sea-Based Weapon Systems 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. Sea-Based Weapon Systems also provides a Long Range Surveillance and Track (LRS&T) capability to the MDS. Upgrades to both the Aegis BMD Weapon System and the SM-3 configuration enable Sea-Based Weapon Systems to provide effective, supportable defensive capability against longer range, threats and an enduring Aegis Ashore defensive capability.

This Program Element includes MDS threat discrimination improvements, which will enhance MDS effectiveness against the evolving adversary threat. The result will be a MDS 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. MDS threat discrimination improvements are funded from the Enabling (0603890C), Midcourse (0603882C), BMD Sensors (0603884C), Command and Control, Battle Management, and Communications (C2BMC)(0603896C), and Aegis BMD (0603892C) PEs.

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

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	737.269	814.936	674.825	-	674.825
Current President's Budget	722.582	877.336	732.512	-	732.512
Total Adjustments	-14.687	62.400	57.687	-	57.687
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-43.600			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	106.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-13.078	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-1.609	0.000	57.687	-	57.687

Change Summary Explanation

Net increase in FY 2021 provides a Congressional add for SM-3 Block IIA Engineering Change Proposal (ECPs) and reflects Congressional reductions for Aegis Underlay and excess growth.

Increase in FY 2022 provides for SM-3 Block IB Threat Upgrade (TU)/Technology Refresh (TR) to modernize the Advance Signal Processor (ASP) and mitigate obsolescence issues; re-phasing from FY 2023 to align with updated cost estimates for Builds 8.2 and 8.3 completions which includes associated new threats and completes the Missile Power Application Non-Launch (MPAN) capability insertion and the integration of the threats captured in Sea Based Terminal (SBT) Increment II Capability Upgrade (CU); AWS and SM-3 Block IIA software upgrades for increased capability against expanded threat/mission space and increase performance for persistent deployment in support of Layered Homeland Defense. Increase also provides integration activities to meet planned demonstration objectives for a transportable deployment option.

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COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD09: *Aegis BMD*	3,034.373	285.313	361.441	437.453	-	437.453	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides concepts, system-level requirements and preliminary design for methods to achieve persistent deployment in support of Layered Homeland Defense and the transition of:
- RF Links Improvements Accomplishment from Budget Project MC09 - Cyber Operations;
- Missile Cyber activities from Network/System Certification and Accreditation (C&A) to Budget Project MM09; and
- Weapon Systems Cyber activities from the Network/System C&A Accomplishment to Budget Project MD09, Aegis BMD 6.X Accomplishment.

A. Mission Description and Budget Item Justification

Sea-Based Weapon Systems 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 MDS integration.

Aegis 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 MDS system level.

Aegis Baseline (BL) 5.4.0 (BMD 4.1.2) is a joint effort with the U.S. Navy developing a single Aegis Weapon System that merges BMD 4.1 and Aegis BL 5.3 computer programs within the current BMD 4.x weapon system architecture. Additional capabilities provide Anti-Air Warfare (AAW) improvements, SM-6 Dual I Extended Range AAW/Anti-Surface Warfare (ASUW), interoperability improvements, and updated BMD threat adaptation data.

Aegis BL 5.4.1 (BMD 4.2) is a joint effort with the U.S. Navy that refurbishes existing ship AN/SPY-1 radar arrays with the installation of antenna Low Noise Amplifiers (LNAs). This baseline will provide update to 21 Flight I/II Destroyers (DDG) with increased capability to maintain relevance through End of Service Life. Capabilities delivered include discrimination improvements, expanded threat set, increased stand-off range, expanded ship operating area, and war fighter requested improvements.

Aegis BL 9 (BMD 5.1.3, BMD 5.1.4, BMD 5.1.5, BMD 5.1.6 Software Spiral development) aligns with U.S. Navy Aegis Baseline 9 Capability Packages 2021, 2022, 2023, and 2024 respectively. The software spirals provide enhanced detection, track, report, and defeat capabilities of additional intermediate range threats with increasingly complex engagement scenes and increased raid sizes. Through a series of unique Capability Insertion Packages, BMD 5.X capability spirals provides continuous

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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software updates to the original BMD 5.1.0 architecture to incorporate emerging MDS capabilities, War fighter improvements, SM-3 software updates, and improved Weapon System performance necessary to pace the threat.

Aegis BL 10 (BMD 6.0) incorporates the solid state Air and Missile Defense Radar (AMDR), now designated AN/SPY-6(v)1, for introduction on the first Flight III DDG. Aegis BL 10 (BMD 6.0) will provide deployed assets enhanced Integrated Air and Missile Defense (IAMD) capability, while enabling MDS element utilization of SPY-6 data for remote engagement. Enhancements include significant improvements in IAMD planning, search, track, discrimination and force level (multi-asset) raid defense. Aegis BL 10 (BMD 6.0) will enable U.S. Navy ships to maintain greater stand-off range while increasing performance against complex threats.

Aegis Layered Homeland Defense includes 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.

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 Integrated Master Test Plan (IMTP) events, MDS capability delivery assessments, War fighter training, exercises, and wargames.

M&S MDS Simulations & Tools effort provides development and sustainment of digital products and the architecture framework, and delivery/maintenance of infrastructure for MDS performance assessments.

MDS System Assessment and Verification, Validation & Assessment (VV&A) includes activities to support MDS Operational Capacity Baseline (OCB) delivery decisions and Technical Capability Declarations (TCDs), and anchor System M&S.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Systems Engineering & Integration	20.417	18.999	19.721
Articles:	-	-	-
Description: Perform requirements development, engineering analysis, capability integration, and performance verification for Aegis BMD development and MDS integration, including Aegis BMD compliance with the MDS Specification and MDS Description Document. Recurring Accomplishments: - Conduct system level performance analyses to support ongoing MDS Architecture and Systems Engineering efforts - Perform top-down system level engineering analysis, capability integration, and performance verification for Aegis BMD development and MDS integration, including Aegis BMD compliance with the MDS System Specification and MDS System Description Document - Identify architecture alternatives that improve the MDS System's performance and are complementary to and interoperable with NATO systems and theaters around the world - Define MDS technical content expectations and develop system requirements, to include integration of new capabilities, such as the U.S. Navy's AMDR			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Develop functional performance, interface, and design suitability requirements in collaboration with Aegis BMD engineers to ensure correct flow-down and allocation of MDS System-level requirements to Aegis BMD - Respond to Warfighter, Combatant Command and other requests for analyses and requests for information; provide analytical support for real-world events - Conduct non-advocate assessments of MDS capabilities and limitations prior to capability delivery decisions to determine fielding readiness (including Theater/Regional BMD) - Conduct extensive analysis of data collected in MDS test events to evaluate MDS System operations and performance Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion	46.919	56.567	46.290
Articles:	-	-	-
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), M&S, V&V, test and evaluation support, and ship integration. M&S V&V efforts in this accomplishment are performed at the Aegis BMD element level, which feed into the overall MDS system level. Recurring Accomplishments: - Conduct U.S. Navy and Joint Link certifications required for Baseline certifications for operational deployment - Support Ground Test Campaign for MDS to achieve OCB declaration - Execute V&V activities and provide results to MDA System Verification Team and the Operational Test Agency (OTA) in support of 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 MDS 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 MDS interoperability issues			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- 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 MDS architecture - Provide verified, validated, accredited models in support of U.S. Navy certification, MDA characterization of system-level performance, OTA assessment of operational capabilities, and representation of Aegis BMD capabilities in MDS 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 Element Specification (ES) requirements traced to MDS 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 Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Provide Electronic Protection analysis - Develop and mature Regional Sensor Advanced Discrimination solutions and M&S updates for multiple Aegis BMD architectures - Provide Software Development of End-to-end Digital Integrated System-level Simulation (EDISS) Full Digital Product (FDP), Increments 1 and 2 - Complete systems engineering for FDP Inc 1, initiate systems engineering for FDP Inc 2, including System Requirements Review and System Functional Review - Provide software development for FDP Inc 1, including Spiral In-Progress Reviews - Conduct integration and testing for FDP Inc 1 - Deploy Phase 1 of Ground Test Integrated System-level Simulation (GTISS) improvements to the MDA Ground Test Architecture to address BMDS Operational Test Agency (OTA) identified issues - Provide software development of GTISS Phase 2, including in-progress technical reviews - Integrate and test GTISS Phase 2 M&S - Conduct requirements and functional analysis for GTISS Phase 3 - Conduct Systems Engineering Technical Reviews and develop GTISS Phase 3 system design ***FY 2022 Plans:*** - Implement Interface Change Proposals (ICPs) into Command and Control Processor (C2P) - Perform Independent Verification and Validation (IV&V) of ICPs into C2P - Implementation of ICPs supporting Army Integrated Battle Command System (IBCS) and C2BMC integration			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Execute Aegis BMD feasibility analysis in support of MDS future architecture strategies and War fighter needs - Transition feasible weapon system improvements into Baseline development efforts - Continue to transition mature Regional Sensor Advanced Discrimination solutions and M&S into Baseline development efforts - Execute analysis and concept exploration to meet the MDS discrimination needs and objectives - Execute a System Requirements Review (SRR) for BMD 6.0.1. BMD 6.0.1 is planned to update the BMD 6.0 to meet Ballistic Missile Defense System Support (BMDSS) requirements beyond Increment 8 - Complete verification analysis and Objective Quality Evidence for OCB report out of Aegis BMD 5.1.4 - Execute a System Requirements Review (SRR) for BMD 5.2.1. BMD 5.2.1 is an update to BMD 5.2 to meet MDS System Specification requirements through Increment 9. - Execute threat analysis to define Aegis BMD Element Specifications (ES) requirements to support MDS System Specification Defended Area (DA) and Integrated Engagement Plan (IEP) requirements. Task addresses existing MDS System Specification performance widows. - Execute threat analysis to support MDS Increment 9 and 10 advanced threats beyond current Aegis BMD threat space. - Expand automated test and verification capabilities, to include automated performance verification and SM-3 test and verification - Complete Final VV&A, test and Accreditation for EDISS Increment 2 - Complete element design, development, requirements and system functional analysis, and system integration, test and VV&A for EDISS Increment 3 - Begin Requirements, element design, development, integration and System functional analysis for EDISS Increment 4 - Continue to Integrate and test GTISS Phase 2 M&S - Deploy Phase 2 of GTISS improvements to the MDA Ground Test Architecture to address MDS OTA identified issues - Provide engineering and software development of GTISS Phase 3, including in-progress technical reviews ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY2021 to FY2022 reflects a decrease in C4I integration efforts, discrimination and threat analysis, and requirements development across Aegis Baselines and SM-3 Variants.			
Title: Aegis BMD 4.x Development	63.357	74.195	56.713
Articles:	-	-	-
Description: Aegis Baseline 5.4.0 (BMD 4.1.2) incorporates the BMD 5.0 Capability Upgrade (CU) of European Phased Adaptive Approach (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 5.4.1 (BMD 4.2) baseline development takes advantage of refurbished and upgraded AN/SPY-1 radar arrays with LNAs by increasing BMD capabilities with improved radar sensitivity, discrimination, threat upgrades, and more efficient radar resource utilization.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Recurring Accomplishments: - Update Critical Item Development (CIDS), Interface Description Specifications (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) - Participate in program leadership and technical forums including Program Management Team, System Engineering Team, and Cross Product Teams for Integration and Test, M&S, Test, Evaluation & Certification, and Fleet Integration and Design - Provide Weapon System updates to include MIL-SPEC UYK-43, Commercial Off-The-Shelf (COTS) BMD Signal Processor, and COTS adjunct processor updates - MDA/Navy co-funded effort to provide BMD capability on Flight I/II DDGs Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** For Aegis Baseline 5.4.1 (BMD 4.2): - Perform computer program integration efforts, capability development and coding; unit test and element computer program integration and test; ET&E, and MEI&T with regression testing - Conduct two IPRs in FY 2021 - Conduct increased threat sensitivity runs in MEDUSA to account for new additional threats - Incorporate new baseline requirements as a result of an FY 2020 System Requirements Review (SRR) - Develop ship change documents supporting the Radar Array Face replacement ***FY 2022 Plans:*** For Aegis Baseline 5.4.1 (BMD 4.2): - Complete computer program integration efforts, capability development and coding; unit test and element computer program integration and test; and Engineering Test and Evaluation (ET&E), and Multi-Element Integration and Test (MEIT) with regression testing to support: - In-Process Review (IPR) #5 - AEGIS BL 5.4.1 Engineering Evaluation (EE) - AEGIS BL 5.4.1 (BMD 4.2) Engineering Assessment (EA) - Continue increased threat sensitivity runs in MEDUSA to account for new additional threats - Complete the incorporation of new baseline requirements as a result of an FY 2020 SRR - Conduct prototype install on first ship to finalize Ship Change Notice development in support of future ship installs in preparation of At-Sea testing and tracking event			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Conduct testing on first ship to test LNAs in a shipboard environment ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects completion of major development functionality and shifting focus to implementation and development testing at-sea.			
Title: Aegis BMD 5.x Development	15.914	51.682	46.165
Articles:	-	-	-
Description: In alignment with U.S. Navy Aegis Baseline 9 Capability Packages (CP)(2021, 2022, 2023, and 2024), Aegis BMD 5.X will develop a series of unique Capability Insertion Packages (CIP) that expand detection, track, report, and defeat capabilities of additional intermediate range threats with increasingly complex engagement scenes and increased raid sizes. Aegis BMD capability packages are focused towards Aegis Baseline 9 DDGs and Aegis Ashore Missile Defense Systems (AAMDS). Annual capability upgrades are necessary to pace the evolving threat, improve system reliability, and incorporate technological growth. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** Deliver Aegis BMD 5.1.3 (Aligned with Navy AEGIS Baseline 9 2021): CIP includes: - Missile Power Application Non-Launch (MPAN) Increment 1: Provides SM-3 Block IIA missile reprogramming capability in operational environment (Aligned with SM-3 Software Build 8.0/8.1) - Active Sensor Bias: Provides updates to improve radar tracking performance and report tracking bias to the Missile Defense System (MDS) - 5th Fleet Urgent Operational Need (UON): Incorporate additional threat systems in support of 5th Fleet UON Continue Aegis BMD 5.1.4 (Aligned with Navy Aegis Baseline 9 2022): CIP Includes: - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 8.0/8.1 software updates and threat set) - Hypersonic TDL Upgrades: Incorporates two (2) TDL Interface Change Proposals (ICP) in support of BMDS Hypersonic track and reporting requirements - Electronic Attack/Electronic Protection (EA/EP) Increment 1: Provides initial weapon system improvements for operations in complex EA environments - MPAN Increment 2: Builds upon Increment 1 (BMD 5.1.3) by providing parallel processing and multi-cycle reprogramming, which decreases software update cycle times for the SM3 Block IIA missile - Aegis Ashore TI-12 Hybrid (TI-12H) Integration: Provides weapon system updates and integration of TI-12H architecture in Aegis Ashore Missile Defense Systems			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Doppler Data Collection System: Provides capability to collect Doppler data on RADAR tracks - 5th Fleet Urgent Operational Need (UON): Incorporate additional threat systems in support of 5th Fleet UON Commence Aegis BMD 5.1.5 (Aligned with Navy Aegis Baseline 9 2023): CIP Includes: - Expanded Hypersonic Track and Report (Increment 2): Continues development and delivery of Hypersonic tracking and reporting with MDS performance requirements - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 8.2/8.3 software updates and threat set) - Aegis BMD Warfighter Improvements: Incorporates/Integrates Warfighter feedback through enhancements to existing functionality - Enhanced Aegis Data Link: Provides interface update between SPY-1 RADAR and SM3 missile - Aegis Remote Engagement (ARE): Integrates interface updates with the MDS to use additional remote data sources for Aegis BMD engagements Commence Aegis BMD 5.1.6 (Aligned with Navy Aegis Baseline 9 2024): CIP Includes: - Expanded Active Sensor Bias (Increment 2): Provides updates to improve radar tracking performance and report tracking bias across BMDS sensors for improved track quality - Increased Boost Phase Communications (9-State Plus): Provides additional position, velocity, and acceleration track covariance over the TDL for boosting track in support of the GMD mission - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 9.0 software updates and threat set) - Aegis BMD Warfighter Improvements: Incorporates/Integrates Warfighter feedback through enhancements to existing functionality ***FY 2022 Plans:*** Deliver Aegis BMD 5.1.4 (Aligned with Navy Aegis Baseline 9 Capability Package 2022): CIP Includes: - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 8.0/8.1 software updates and threat set) - Hypersonic TDL Upgrades: Incorporates two (2) TDL Interface Change Proposals (ICP) in support of BMDS Hypersonic track and reporting requirements - Electronic Attack/Electronic Protection (EA/EP) Increment 1: Provides initial weapon system improvements for operations in complex EA environments			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- MPAN Increment 2: Builds upon Increment 1 (BMD 5.1.3) by providing parallel processing and multi-cycle reprogramming, which decreases software update cycle times for the SM3 Block IIA missile - Aegis Ashore TI-12 Hybrid (TI-12H) Integration: Provides weapon system updates and integration of TI-12H architecture in Aegis Ashore Missile Defense Systems - Doppler Data Collection System: Provides capability to collect Doppler data on RADAR tracks - 5th Fleet Urgent Operational Need (UON): Incorporate additional threat systems in support of 5th Fleet UON Continue Aegis BMD 5.1.5 (Aligned with Navy Aegis Baseline 9 2023): CIP Includes: - Expanded Hypersonic Track and Report (Increment 2): Continues development and delivery of Hypersonic tracking and reporting with MDS performance requirements - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 8.2/8.3 software updates and threat set) - Aegis BMD Warfighter Improvements: Incorporates/Integrates Warfighter feedback through enhancements to existing functionality - Enhanced Aegis Data Link: Provides interface update between SPY-1 RADAR and SM3 missile - Aegis Remote Engagement (ARE): Integrates interface updates with the MDS to use additional remote data sources for Aegis BMD engagements Continue Aegis BMD 5.1.6 (Aligned with Navy Aegis Baseline 9 2024): CIP Includes: - Full Active Sensor Bias (Increment 2): Provides updates to improve radar tracking performance and report tracking bias to the MDS - Increased Boost Phase Communications (9-State Plus): Provides additional position, velocity, and acceleration track covariance over the TDL for boosting track in support of the GMD mission - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 9.0 software updates and threat set) - Aegis BMD Warfighter Improvements: Incorporates/Integrates Warfighter feedback through enhancements to existing functionality ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the completion of BMD 5.1.3 in FY 2021.			
Title: Aegis BMD 6.x Development	71.114	88.638	84.443
Articles:	-	-	-

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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 2020	FY 2021	FY 2022
Description: The U.S. Navy is developing the Advance Capability Build (ACB) 20 Combat System (CS) and the 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 and 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. Recurring Accomplishments: - Develop Critical Item Development (CIDS), Interface Description Specifications (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) - Participate in program leadership and technical forums including Program Management Team, System Engineering Team, and Cross Product Teams for Integration and Test, M&S, Test, Evaluation & Certification, and Fleet Integration and Design - Develop computer program for Aegis BMD 6.0 supporting Software Increment Reviews (SWIR) - MDA/Navy co-funded effort to provide BMD capability on Flight III DDGs - Expanded BMD Tracking and reporting updates Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Conduct Aegis BMD 6.0 concurrent engineering across Mission Planner (Polygon Defended Area/Launch Area/Weapons Doctrine & Real-Time Plan Response), IAMD/BMD Search & Track, Engagement Scheduling, Engagement Capacity, Raid and Dual Tier/Remote Engagement areas - Continue SPY-6 integration efforts, capability development, and performance analysis - Continue Aegis BMD 6.0 design, code, test and performance analysis across the BMD Mission area ***FY 2022 Plans:*** - Continue Aegis BMD 6.0 concurrent engineering across Mission Planner (Polygon Defended Area/Launch Area/Weapons Doctrine & Real-Time Plan Response), IAMD/BMD Search & Track, Engagement Scheduling, Engagement Capacity, Raid and Dual Tier/Remote Engagement areas - Continue SPY-6 integration efforts, capability development, and performance analysis with focus shifted to on-ship/at-sea - Continue Aegis BMD 6.0 design, code, test and performance analysis across the BMD Mission area with focus shifted to on-ship/at-sea - Conduct EA against BMD 6.0 capabilities			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Perform on-ship Aegis Light Off (ALO) and begin Sea Trials ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects continuation of major development functionality and shifting focus to implementation and development testing at-sea.			
Title: Aegis Layered Homeland Defense Development	9.595	12.469	98.963
Articles:	-	-	-
Description: Aegis Weapon System (AWS) and SM-3 Block IIA software modifications to existing systems to support a phased delivery of operational capability. The planned phased updates will build on the proven residual capability demonstrated in FTM-44 in CY 2020.The second phase of planned capability will increase system performance against moderate threats for Aegis BMD to provide an initial under layer capability to GMD in support of Homeland Defense. The third phase of planned capability will expanded threat/mission space and increase system performance against more complex threats to provide a robust under layer capability to GMD in support of Homeland Defense. In addition to increasing the performance capability of Aegis BMD, assess deployment options to include both transportable and persistent approaches. ***FY 2021 Plans:*** - Conduct analysis to inform system level requirements and implement an acquisition strategy to facilitate system development to expanded threat/mission space and increase system performance against moderate threats - Assess options and evaluate concepts for alternate SM-3 deployment methods to achieve both transportable and persistent deployment in support of Layered Homeland Defense, excluding any activities to increase system performance against moderate threats - Define concept and test plan for demonstration of transportable deployment concepts, utilizing the existing Aegis Weapon System fire control as point of departure, to complement existing MDS elements - Identify and resolve integration challenges ***FY 2022 Plans:*** - Refine system level requirements and facilitate system development to expanded threat/mission space and increase system performance against moderate threats - Conduct System Requirements Review - Execute design and implementation of Weapon System and Standard Missile (SM-3 Block IIA) software upgrades in support of the phased delivery of operational capability against expanded threat/mission space and increase system performance against moderate threats to provide an initial under layer capability to GMD in support of Homeland Defense - Refine concepts for alternate SM-3 deployment methods to achieve both transportable and persistent deployment in support of Global Regional Defense Operations and Layered Homeland Defense, excluding any activities to increase system performance against moderate threats			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Refine transportable deployment concept and execute design modifications to the following components: C2 component with Virtualized Aegis Weapon System (VAWS), Launcher component capable of firing SM-3 Block IIA and an Interceptor Communications component with antenna for in-flight uplink/downlink between VAWS and SM-3 Block IIA - Execute integration activities (e.g., communication antenna systems) required to meet planned demonstration objectives and resolve integration challenges of components - Continue to refine test plan for demonstration of transportable deployment concept - Conduct analysis addressing MDS Layered Homeland Defense Mid-term (FY2025-FY2029) Capability Evolution goals to include integrated battle management concepts and feasibility analysis for Aegis BMD system level performance - Conduct evaluation of enabling software and hardware technologies for both the AWS and the SM-3 in support of a future operational capability against expanded threat/mission space and increase system performance against more complex threats ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides AWS and SM-3 Block IIA software upgrades for increased capability against expanded threat/mission space and increase performance for persistent deployment in support of Layered Homeland Defense. Increase also provides integration activities to meet planned demonstration objectives for a transportable deployment option.			
Title: Modeling & Simulation Objective Simulation Framework	34.888	32.829	33.366
Articles:	-	-	-
Description: This effort develops, maintains and deploys the framework hardware and software for use at element laboratories and CCMD locations to support IMTP events, MDS capability delivery assessments, Warfighter training, exercises, and Wargames. Recurring Accomplishments: - Develop and implement 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 - Sustain and enhance framework products to maintain capabilities to support stakeholders - Develop plans, procedures and documentation for scheduled events including Wargames and Combatant Command Exercises and the Distributed, Focused and Integrated hardware in the loop (HWIL) Events as presented in the IMTP. Provide event architecture integration and checkout of Wargames for these same IMTP scheduled events - 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 MDS test framework to integrate distributed architectures in support of MDS - 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.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- 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. - Continue maintenance of the Single Stimulation Framework in the required venues until the transition of the Objective Simulation Framework into the venues completes. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: M&S BMDS Simulations &Tools	4.460	4.543	4.455
Articles:	-	-	-
Description: This effort includes: development and sustainment of digital products and the architecture framework, and delivery/ maintenance of infrastructure for MDS performance assessments. Recurring Accomplishments: - Integrate, test, and verify the M&S enterprise supporting MDS 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 MDS 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 Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: BMDS Verification, Validation & Assessment (VV&A) ***Articles:*** ***Description:*** This activity includes MDS System Assessment and VV&A activities to support MDS OCB delivery decisions and TCDs, and anchor System modeling and simulation. Recurring Accomplishments: - Verify MDS performance, and produce MDS verification status reports - Conduct extensive analysis of data collected in MDS ground and flight test events, instrumental to understanding MDS System operations and performance and anchoring models and simulations - Identify mitigation approaches for MDS performance issues uncovered during system level analysis and assessment - Maintain M&S VV&A database, and verification data for MDS 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 - Conduct V&V in support of MDA MDS System level accreditation process in support of MDS Ground Test and performance assessment events - Conduct specified MDS 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 MDS accreditation. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Conduct V&V of Aegis BMD digital models in support of accreditation process for MDS Ground Test and performance assessment events ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A	18.649 -	21.519 -	19.912 -
Title: RF Link Improvements ***Articles:*** ***Description:*** The U.S. Navy is pursuing improvements identified by Engineering Topic 17 (ET-17) within Aegis Baseline 10 development and specific missile type. Radio Frequency (RF) Link Security Improvements will advance communications between	0.000 -	0.000 -	27.425 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Aegis BMD Weapon System and SM-3 Block IB and IIA missile variants. Product development and implementation will enable missile hardware enhancements in order to achieve the full requisite Missile RF Link Security Improvements. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** All efforts for this accomplishment have transitioned from Budget Project, MC09 Cyber Operations - Begin software development and hardware prototype efforts to include initial integration testing - Conduct analysis and design trades to define encryption scheme for the weapon system, including backwards compatibility with missiles without RF Link Security upgrades - Update Aegis BMD Weapon System requirements and interface specifications to incorporate changes between the weapon system and missile message link ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for the transition of RF Links Improvements Accomplishment from Budget Project MC09 - Cyber Operations to MD09 to align with the Financial Management Regulation (FMR) definition of weapons system cyber activities.			
Accomplishments/Planned Programs Subtotals	285.313	361.441	437.453

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: *MD09: Aegis BMD O&M*	74.642	79.913	68.293	-	68.293	-	-	-	-	-	-
• 0208866C: *MD09: Aegis BMD Procurement*	336.374	353.896	334.621	-	334.621	-	-	-	-	-	-
• 0208866C: *MD73: Aegis Ashore Procurement*	26.495	34.629	25.866	-	25.866	-	-	-	-	-	-
• 0208866C: *MD90: Aegis Hardware and Software Procurement*	124.150	104.241	81.791	-	81.791	-	-	-	-	-	-
• 0604878C: *Aegis BMD Test*	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The Sea-Based Weapon Systems 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 Sea-Based Weapon Systems 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).

The Layered Homeland Defense acquisition strategy leverages existing Sea-Based Weapon System program awarded sole source contracts with Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon Systems. Acquisition requirements for the transportable deployment option will also use existing contracts within Sea-Based Weapon Systems or within the partner element on the project. Additional information can be provided at the appropriate classification level.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering & Integration - Systems Engineering	Various	MDA Various : VA, AL	67.170	1.813	Nov 2019	1.330	Nov 2020	0.936	Nov 2021	-		0.936	Continuing	Continuing	Continuing
Systems Engineering & Integration - Systems Engineering - CSS	C/CPFF	TEAMS : VA	21.552	5.312	Nov 2019	4.262	Nov 2020	5.485	Nov 2021	-		5.485	Continuing	Continuing	Continuing
Systems Engineering & Integration - Systems Engineering - Industry	C/CPAF	Boeing : VA	75.585	13.292	Nov 2019	13.407	Nov 2020	13.300	Nov 2021	-		13.300	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD APL	SS/CPAF	JHU/APL : Columbia, MD	37.849	9.261	Nov 2019	12.260	Nov 2020	6.660	Nov 2021	-		6.660	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD LM	C/CPFF	Lockheed Martin : Moorestown, NJ	35.545	3.284	Nov 2019	5.030	Nov 2020	7.730	Nov 2021	-		7.730	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD MIT	MIPR	Hanscom AFB - MIT/ LL : Lexington, MA	20.586	5.074	Nov 2019	5.677	Nov 2020	3.651	Nov 2021	-		3.651	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD MITRE	MIPR	CECOM - MITRE : Dahlgren, VA	3.565	0.496	Nov 2019	1.966	Nov 2020	0.474	Nov 2021	-		0.474	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD NSWCDD	MIPR	NSWC DD : Dahlgren, VA	35.536	8.644	Nov 2019	12.148	Nov 2020	8.354	Nov 2021	-		8.354	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - NIWC Pacific	MIPR	NIWC PAC : San Diego, CA	10.185	5.436	Nov 2019	7.059	Nov 2020	9.186	Nov 2021	-		9.186	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Strategic Investment	MIPR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Technology Design and Insertion - Discrimination	MIPR	Various - MDA : AL,VA	15.895	1.745	Nov 2019	2.193	Nov 2020	0.000		-		0.000	0.000	19.833	0.000
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Technology Design and Insertion - M&S improvements	MIPR	Various - MDA : AL, VA	0.000	8.913	Nov 2019	9.928	Nov 2020	10.235	Nov 2021	-		10.235	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Various - MDA	MIPR	Various - MDA : AL,VA,CA	28.511	4.066	Nov 2019	0.306	Nov 2020	0.000		-		0.000	0.000	32.883	0.000
Aegis BMD 4.x Development - BMD 4.0 Dev -MD09- Aegis Techrep	MIPR	AEGIS Techrep : Moorestown, NJ	3.582	0.865	Nov 2019	4.684	Nov 2020	2.947	Nov 2021	-		2.947	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. - MD09 - Dahlgren	MIPR	NSWC/DD : DAHLGREN, VA	155.675	5.111	Nov 2019	6.443	Nov 2020	9.404	Nov 2021	-		9.404	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. - MD09 - Lockheed Martin	SS/CPIF	LOCKHEED MARTIN : MOORESTOWN, NJ	835.052	55.261	Nov 2019	49.509	Nov 2020	41.856	Nov 2021	-		41.856	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. -MD09- BMD 4.0 Dev-	Various	Various : Various	44.610	2.120	Nov 2019	4.968	Nov 2020	2.506	Nov 2021	-		2.506	Continuing	Continuing	Continuing

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis BMD 4.x Development - BMD 4.0 Dev.-MD09-D	MIPR	MDA : VA	31.834	0.000		8.591	Nov 2020	0.000		-		0.000	0.000	40.425	0.000
Aegis BMD 5.x Development - MD09 - 5.x	SS/CPAF	LOCKHEED MARTIN : MOORESTOWN, NJ	721.217	11.834	Nov 2019	35.117	Nov 2020	33.595	Nov 2021	-		33.595	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 5.x APL	SS/CPFF	JHU/APL/MD : COLUMBIA, MD	54.663	0.000		2.828	Nov 2020	2.489	Nov 2021	-		2.489	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 5.x DD	MIPR	NSWC/DD : DAHLGREN, VA	77.211	1.375	Nov 2019	9.331	Nov 2020	8.213	Nov 2021	-		8.213	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 5.x PHD	MIPR	NSWC/PHD : PT HUENEME, CA	11.463	0.929	Nov 2019	0.935	Nov 2020	0.823	Nov 2021	-		0.823	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - AW	MIPR	Aegis Tech Rep : Moorestown, NJ	4.509	1.776	Nov 2019	1.187	Nov 2020	1.045	Nov 2021	-		1.045	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - Various	MIPR	Various : MA, MD, VA, NJ	209.059	0.000		2.284	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - D - Strategic Investment	MIPR	Various : Various	0.000	0.000		0.000		4.786	Nov 2021	-		4.786	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - JHU/APL	SS/CPFF	JHU/APL : MD	13.827	6.132	Nov 2019	5.978	Nov 2020	7.006	Nov 2021	-		7.006	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - Lockheed Martin	C/CPFF	Lockheed Martin : NJ	76.378	47.263	Nov 2019	70.797	Nov 2020	53.270	Nov 2021	-		53.270	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - MD09 - DD	MIPR	NSWC/DD : Dahlgren, VA	11.659	8.432	Nov 2019	5.932	Nov 2020	9.634	Nov 2021	-		9.634	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - Raytheon Integrated Defense Systems	MIPR	Raytheon : Waltham, MA	0.000	0.000		0.000		4.579	Nov 2021	-		4.579	Continuing	Continuing	Continuing

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis BMD 6.x Development - Various	MIPR	Various : MA, MD, VA, NJ, CA	27.104	9.287	Nov 2019	5.931	Nov 2020	5.168	Nov 2021	-		5.168	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - APL	SS/CPFF	JHU/APL : MD	0.000	1.369	Nov 2019	2.000	Nov 2020	7.553	Nov 2021	-		7.553	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - DD	MIPR	NSWC DD : Dahlgren VA	0.000	1.712	Nov 2019	2.000	Nov 2020	9.163	Nov 2021	-		9.163	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - LM	SS/CPFF	Lockheed Martin : Moorestown NJ	0.000	0.327	Nov 2019	6.969	Nov 2020	15.800	Nov 2021	-		15.800	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - MIT/ LL	MIPR	MIT/LL : Lexington MA	0.000	1.183	Nov 2019	1.500	Nov 2020	8.050	Nov 2021	-		8.050	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - RMS	SS/CPIF	Raytheon : AZ	0.000	0.000		0.000		8.960	Nov 2021	-		8.960	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Weapon System - MD09 - Aegis Techrep	MIPR	Aegis Techrep : Moorestown NJ	0.000	0.000		0.000		0.499	Nov 2021	-		0.499	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Weapon System - MD09 - DD	MIPR	NSWC DD : Dahlgren VA	0.000	0.000		0.000		0.832	Nov 2021	-		0.832	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Weapon System - MD09 - LM	SS/CPFF	Lockheed Martin : Moorestown NJ	0.000	2.128	Nov 2019	0.000		37.861	Nov 2021	-		37.861	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Standard Missile - 3 (SM-3) Block IIA Development - MD09 - Raytheon	SS/CPIF	Raytheon : AZ	0.000	2.770	Nov 2019	0.000		10.245	Nov 2021	-		10.245	Continuing	Continuing	Continuing

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Layered Homeland Defense Development - Strategic Investment	MIPR	Various : Various	0.000	0.106	Nov 2019	0.000		0.000		-		0.000	0.000	0.106	0.000
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering	Various	MDA : AL, VA	16.927	1.807	Nov 2019	5.453	Nov 2020	4.224	Nov 2021	-		4.224	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - CSS Support	C/CPFF	TEAMS : AL, CO	24.540	7.344	Nov 2019	6.375	Nov 2020	5.547	Nov 2021	-		5.547	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Engineering Support	C/CPAF	Northrop Grumman : CO	41.660	0.000		0.000		0.000		-		0.000	0.000	41.660	0.000
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Integration	MIPR	CCDC : AL	26.933	3.090	Nov 2019	4.067	Nov 2020	3.398	Nov 2021	-		3.398	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Prime	C/CPFF	Teledyne Brown Engineering / TBD : AL, CO	151.236	22.647	Nov 2019	0.000		0.000		-		0.000	0.000	173.883	0.000
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Prime 2	C/CPFF	Lockheed Martin : AL	0.000	0.000		16.934	Nov 2020	20.197	Nov 2021	-		20.197	Continuing	Continuing	Continuing
M&S BMDS Simulations &Tools - Sims & Tools	C/CPFF	Teledyne Brown Engineering : AL, CO	3.558	0.000		0.000		0.000		-		0.000	0.000	3.558	0.000
M&S BMDS Simulations &Tools - Sims & Tools - Industry	C/CPAF	Northrop Grumman : CO	40.308	0.000		0.000		0.000		-		0.000	0.000	40.308	0.000
M&S BMDS Simulations &Tools - Sims & Tools - Industry (2)	C/CPAF	SWDC : CO	0.000	3.700	Nov 2019	4.069	Nov 2020	3.355	Nov 2021	-		3.355	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M&S BMDS Simulations &Tools - Sims & Tools - Various	Various	Various : AL, CO	0.659	0.760	Nov 2019	0.474	Nov 2020	1.100	Nov 2021	-		1.100	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment	Various	MDA Various : AL, VA	7.395	0.000		0.000		0.000		-		0.000	0.000	7.395	0.000
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - CSS Support	C/CPFF	TEAMS : AL	16.058	0.806	Nov 2019	1.531	Nov 2020	2.462	Nov 2021	-		2.462	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - Industry	C/CPAF	Boeing : AL	27.381	6.776	Nov 2019	9.365	Nov 2020	7.370	Nov 2021	-		7.370	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - Labs	MIPR	MITRE : VA	9.617	2.236	Nov 2019	1.368	Nov 2020	0.847	Nov 2021	-		0.847	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - OGA	MIPR	CCDC : AL	34.158	6.974	Nov 2019	7.038	Nov 2020	7.162	Nov 2021	-		7.162	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - UARC2	MIPR	JHU/APL : AL, VA	4.121	1.857	Nov 2019	2.217	Nov 2020	2.071	Nov 2021	-		2.071	Continuing	Continuing	Continuing
RF Link Improvements - BL 9/ BL 10 Missile RF Link Improvements	MIPR	Various : TBD	0.000	0.000		0.000		1.357	Nov 2021	-		1.357	Continuing	Continuing	Continuing
RF Link Improvements - RF Link Improvements - Dahlgren	MIPR	NSWC - Dahlgren : Dahlgren, VA	0.000	0.000		0.000		2.009	Nov 2021	-		2.009	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RF Link Improvements - RF Link Improvements - SM-3	SS/CPFF	Raytheon : Tucson, AZ	0.000	0.000		0.000		21.512	Dec 2021	-		21.512	Continuing	Continuing	Continuing
RF Link Improvements - RF Link Improvements - SM-3 APL	SS/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		1.511	Nov 2021	-		1.511	Continuing	Continuing	Continuing
RF Link Improvements - RF Link Improvements - WS	SS/CPIF	Lockheed Martin : Moorestown, NJ	0.000	0.000		0.000		1.036	Nov 2021	-		1.036	Continuing	Continuing	Continuing
		Subtotal	3,034.373	285.313		361.441		437.453		-		437.453	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3,034.373	285.313		361.441		437.453		-		437.453	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.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

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

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
BL 5.4.0 (BMD 4.1.2) EA	✦																											
BMD 6.0 IPR #4	✦																											
BL 5.4.1 (BMD 4.2) SRR		✦																										
BL 5.4.0 (BMD 4.1) Certification			★																									
BL 5.4.1 (BMD 4.2) IPR #1				▲																								
BMD 6.0 IPR #5				▲																								
BMD 5.1.2 Certification				★																								
BMD 5.1.3 BMDS OCB Testing				▲																								
BL 5.4.1 (BMD 4.2) IPR #2					▲																							
BMD 5.1.3 Certification					★																							
BMD 5.1.3 BMDS OCB Approval						▲																						
BL 5.4.1 (BMD 4.2) IPR #3							△																					
BMD 6.0 IPR #6							△																					
BMD 5.1.5 PSRR							△																					
BMD 5.1.4 CB 1.1 EA								◇																				
BMD 5.1.5 SRR								☆																				
BMD 5.1.6 PSRR								△																				
BMD 6.0 EA									△																			
BL 5.4.1 (BMD 4.2) IPR #4									△																			
BMD 5.1.5 IPR #1/PDR									☆																			
BMD 6.0 Capabilities EA									△																			
BMD 5.1.4 CB 1.1 SVR										△																		
BMD 5.1.4 CSCP #1										☆																		
BMD 5.1.6 SRR										☆																		

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

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

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
BMD 5.1.4 OCB #1											☆																	
BMD 5.1.5 CDR											☆																	
BMD 5.1.4 CB 2 EA											◇																	
BL 5.4.1 (BMD 4.2) EA												△																
BMD 5.1.4 CB 2 SVR												△																
BMD 5.1.5 IPR #2/CDR												☆																
BMD 5.1.4 CSCP #2												☆																
BMD 5.1.6 IPR #1/PDR												☆																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BL 5.4.0 (BMD 4.1.2) EA	1	2020	1	2020
BMD 6.0 IPR #4	1	2020	1	2020
BL 5.4.1 (BMD 4.2) SRR	2	2020	2	2020
BL 5.4.0 (BMD 4.1) Certification	3	2020	3	2020
BL 5.4.1 (BMD 4.2) IPR #1	4	2020	4	2020
BMD 6.0 IPR #5	4	2020	4	2020
BMD 5.1.2 Certification	4	2020	4	2020
BMD 5.1.3 BMDS OCB Testing	4	2020	4	2020
BL 5.4.1 (BMD 4.2) IPR #2	1	2021	1	2021
BMD 5.1.3 Certification	1	2021	1	2021
BMD 5.1.3 BMDS OCB Approval	2	2021	2	2021
BL 5.4.1 (BMD 4.2) IPR #3	3	2021	3	2021
BMD 6.0 IPR #6	3	2021	3	2021
BMD 5.1.5 PSRR	3	2021	3	2021
BMD 5.1.4 CB 1.1 EA	4	2021	4	2021
BMD 5.1.5 SRR	4	2021	4	2021
BMD 5.1.6 PSRR	4	2021	4	2021
BMD 6.0 EA	1	2022	1	2022
BL 5.4.1 (BMD 4.2) IPR #4	1	2022	1	2022
BMD 5.1.5 IPR #1/PDR	1	2022	1	2022
BMD 6.0 Capabilities EA	1	2022	1	2022
BMD 5.1.4 CB 1.1 SVR	2	2022	2	2022
BMD 5.1.4 CSCP #1	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BMD 5.1.6 SRR	2	2022	2	2022
BMD 5.1.4 OCB #1	3	2022	3	2022
BMD 5.1.5 CDR	3	2022	3	2022
BMD 5.1.4 CB 2 EA	3	2022	3	2022
BL 5.4.1 (BMD 4.2) EA	4	2022	4	2022
BMD 5.1.4 CB 2 SVR	4	2022	4	2022
BMD 5.1.5 IPR #2/CDR	4	2022	4	2022
BMD 5.1.4 CSCP #2	4	2022	4	2022
BMD 5.1.6 IPR #1/PDR	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MM09: *Aegis BMD SM-3 Development*	302.386	243.194	307.970	124.708	-	124.708	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the reduction of development activities including the GEU ECP, SWUP build 8, and incorporating SWUP build 8 into the production line. This decrease is offset by a minor increase due to transfer of Missile Cyber from Budget Project MC09 - Cyber Operations.

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 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 2020	FY 2021	FY 2022
Title: Standard Missile-3 (SM-3) Block IB Development	35.652	47.133	51.298
Articles:	-	-	-
Description: This effort 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 Threat Upgrade (TU)/Technology Refresh (TR) (previously IB Modernization) will provide the following: - Refreshed SM-3 KW Common Avionics Package will provide improved producibility and utilization of common components between the SM-3 Block IIA. SM-3 Block IB common components will be extendable to support different form/fit in circuit card assemblies across SM-3 Block IB and SM-3 Block IIA and will mitigate SM-3 Block IB hardware availability issues. Includes Back-fit of IIA GEU ECP into IB			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Refreshed SM-3 Block IB Guidance Section (GS) with the integration of Digital Data Link (DDL) replacement of Plate 3A will resolve Plate 3A hardware availability issues Recurring Accomplishments: - Assess performance with weapons systems upgrades/modifications and against emerging threats Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SM-3 KW Common Avionics - Development of SM-3 Block IB Circuit Card Assemblies (CCAs) to be common with SM-3 Block IIA(IB Common Components will be extendable to support different form/fit in CCAs across SM-3 Block IB, and SM-3 Block IIA) - Back-fit of SM-3 Block IIA GEU ECP into SM-3 Block IB; integration and test to ensure Legacy SM-3 Block IB performance is met; and Digital Integrated Circuit technology - Continue integration of DDL replacement of Plate 3A ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for SM-3 Block IB TU/TR to modernize the Advance Signal Processor (ASP) and mitigate obsolescence issues in the ASP.			
Title: Standard Missile-3 (SM-3) Block IIA Development	207.542	260.837	73.410
Articles:	-	-	-
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 Recurring Accomplishments: - 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 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 (TRL) 7 - Continue Engineering Manufacture Readiness Level (EMRL) 3 compliance to support life cycle progression Specific and unique accomplishments to each FY are as follows:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
FY 2021 Plans: - Complete Software Update builds 8.1 - adds enhanced performance requirements for 6 new threats; and 8.2 - adds Missile Power Application Non-Launch (MPAN) capability, bringing Missile Reprogramming (MRP) to the missile and fleet allowing the Vertical Launch System to conduct Missile Built in Tests (MBIT) onboard the ship while underway and incorporates 3 additional threats. Additionally, allows the capability to update software of the SM-3 IIA Round while aboard the ship, thereby enhancing the ability to conduct updates, which historically only occurred during Recertification. - Complete MPAN Safety approval via Weapons Systems Explosive Safety Review Board (WSESRB) process and fleet introduction - GEU ECP planned activities: - Complete manufacturing readiness review at GEU ECP supplier and manufacturer to verify maturity and production readiness - Complete transition to production of GEU ECP into AURs - Continue Test planning and acquisition of test articles for environmental testing - Continue evaluation of the effects of space environments on the SM-3 Block IIA missile during flight ***FY 2022 Plans:*** - Conduct improved BMD 5.1 Raid to meet BMD 5.1 requirements, discrimination improvements to support future threats, and other BMD System Capability improvements aligned with AWS Baseline Improvements. - Integration and engineering of the SM-3 BLK IIA Build 8 missile with BMD AWS Baselines 5.x. - Completion of program Transition to Production (EMRL 4 maturity). - Complete GEU ECP qualification, integration and Transition to Production development. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the reduction of development activities including the GEU ECP, SWUP build 8, and incorporating SWUP build 8 into the production line. This decrease is offset by a minor increase due to transfer of Missile Cyber from Budget Project MC09 - Cyber Operations to MD09 to align with the FMR definition of weapons system cyber activities.			
Accomplishments/Planned Programs Subtotals	243.194	307.970	124.708

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C MD09: *SM-3 Block IB Procurement*	336.374	353.896	334.621	-	334.621	-	-	-	-	-	-
• 0208866C MD09: *Aegis BMD O&M*	74.642	79.913	68.293	-	68.293	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MM09 / *Aegis BMD SM-3 Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C MD14: *SM-3 Block IIA Procurement*	238.000	318.322	295.322	-	295.322	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Sea-Based Weapon Systems 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 Sea-Based Weapon Systems program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
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 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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 Carderock	MIPR	NSWC Carderock : Bethesda, MD	0.436	0.446	Nov 2019	0.500	Nov 2020	0.000		-		0.000	0.000	1.382	0.000
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09	SS/CPIF	Raytheon : Tuscon, AZ	55.431	33.467	Dec 2019	43.662	Dec 2020	49.606	Dec 2021	-		49.606	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	0.145	0.054	Nov 2019	0.000		0.000		-		0.000	0.000	0.199	0.000
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09 - Various	MIPR	NSWC Corona : Corona, CA	0.424	0.296	Nov 2019	0.333	Nov 2020	0.260	Nov 2021	-		0.260	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09 MIT	MIPR	Hanscom AFB - MIT/ LL : Lexington, MA	1.105	0.000		0.000		0.000		-		0.000	0.000	1.105	0.000
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development- MM09 DD	MIPR	NSWC Dahlgren : Dahlgren, VA	1.201	0.407	Nov 2019	0.316	Nov 2020	0.420	Nov 2021	-		0.420	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development- MM09 JHU/APL	SS/CPFF	JHUAPL : Laurel, MD	1.190	0.982	Nov 2019	2.322	Nov 2020	1.012	Nov 2021	-		1.012	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development -	MIPR	Various : CA, VA, MD	12.906	10.622	Nov 2019	3.742	Nov 2020	1.588	Nov 2021	-		1.588	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Standard Missile-3 (SM-3) Block IIA Development - CA,VA, MD															
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA INTEGRATION	SS/CPIF	Raytheon : Tucson, AZ	186.601	164.987	Nov 2019	238.033	Mar 2021	63.733	Oct 2021	-		63.733	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 - APL	MIPR	JHU/APL : Laurel, MD	20.535	10.364	Dec 2019	9.467	Dec 2020	4.017	Nov 2021	-		4.017	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	10.183	5.882	Nov 2019	5.651	Nov 2020	2.398	Nov 2021	-		2.398	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	4.610	1.953	Nov 2019	2.799	Nov 2020	1.188	Nov 2021	-		1.188	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	1.496	0.970	Nov 2019	1.145	Nov 2020	0.486	Nov 2021	-		0.486	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA	MIPR	Brookhaven Lab - DOE : Uptown NY	0.000	3.830	Oct 2019	0.000		0.000		-		0.000	0.000	3.830	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA Draper	SS/CPIF	Draper Labatory : Cambridge MA	0.000	4.133	Oct 2019	0.000		0.000		-		0.000	0.000	4.133	0.000
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NJ	C/CPFF	Lockheed Martin : Moorestown NJ	6.123	4.801	Dec 2019	0.000		0.000		-		0.000	0.000	10.924	0.000
		Subtotal	302.386	243.194		307.970		124.708		-		124.708	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	302.386	243.194		307.970		124.708		-		124.708	Continuing	Continuing	N/A

Remarks

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

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** 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 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GEU ECP Qualification				✦																								
Build 8.1 Operational Capacity Baseline (OCB)					▲																							
Build 8.1 MPAN WSERB					▲																							
IBTU Tech Refresh PDR						▲																						
Build 8.3 with BMD 5.1.5 SRR								△																				
Build 8.2 Formal Qualification Testing (FQT)									△																			
IBTU Tech Refresh Qualification												△																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
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

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GEU ECP Qualification	4	2020	4	2020
Build 8.1 Operational Capacity Baseline (OCB)	1	2021	1	2021
Build 8.1 MPAN WSERB	1	2021	1	2021
IBTU Tech Refresh PDR	2	2021	2	2021
Build 8.3 with BMD 5.1.5 SRR	4	2021	4	2021
Build 8.2 Formal Qualification Testing (FQT)	1	2022	1	2022
IBTU Tech Refresh Qualification	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC09: *Cyber Operations*	20.949	16.455	29.392	3.750	-	3.750	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the transition of the following funds from the Cyber Operations Budget Project to MD09 Aegis BMD and MM09 Aegis BMD SM-3 Development to align with the FMR definition of weapons system cyber activities:
- RF Link Improvements Accomplishment from Budget Project MC09 Cyber Operations to Budget Project MD09 - Aegis BMD;
- Missile Cyber activities from the Network/System Certification and Accreditation (C&A) to Budget Project MM09; and
- Weapon Systems Cyber activities from the Network/System C&A Accomplishment to Budget Project MD09, Aegis BMD 6.X Accomplishment.

A. Mission Description and Budget Item Justification

Sustain the DoD Risk Management Framework (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 Plan of Action and Milestones (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).

The SM-3 Block IB and IIA missiles and corresponding Aegis BMD weapon systems communication requires hardware and software development and integration testing to enable new cyber security capabilities. Activities include Encoder/Decoder, Plate 3 CCAs and Mission Computer CCA updates. After missile and baseline specific efforts are complete, significant integration testing is required.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	7.665	11.337	3.750
Articles:	-	-	-
Description: Network/System Certification and Accreditation (C&A) includes recurring efforts such as cybersecurity engineering and architecture requirements planning for Aegis BMD systems, plan and test the Risk Management Framework (RMF) controls for the BMDS in regards to Aegis BMD systems to comply with the new directive, RMF for DoD Information Technology (DoDi 8510.01) to replace the DoD Information Assurance Certification and Accreditation process (DIACAP) and conduct Controls Validation Testing (CVT.			
Recurring Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- 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 - Monthly reviews of systems through the eMass System - Daily management of eMass System Plan of Action and Milestones (POAMs) ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the realignment of requirement to SM-3 Blk IIA Development (MM09) for system specific cyber development or component modification efforts and Weapon Systems Cyber activities to MD09.			
Title: RF Link Improvements	8.790	18.055	0.000
Articles:	-	-	-
Description: The U.S. Navy is pursuing improvements identified by Engineering Topic 17 (ET-17) within Aegis Baseline 10 development and specific missile type. Radio Frequency (RF) Link Security Improvements will advance communications between Aegis BMD Weapon System and SM-3 Block IB and IIA missile variants. Product development and implementation will enable missile hardware enhancements in order to achieve the full requisite Missile RF Link Security Improvements. ***FY 2021 Plans:*** - Begin software development and hardware prototype efforts to include initial integration testing - Conduct analysis and design trades to define encryption scheme for the weapon system, including backwards compatibility with missiles without RF Link Security upgrades - Update Aegis BMD Weapon System requirements and interface specifications to incorporate changes between the weapon system and missile message link ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
All efforts for this Accomplishment transitioned from Budget Project, MC09 Cyber Operations to Budget Project MD09 beginning in FY 2022 to align with the FMR definition of weapons system cyber activities.			
Accomplishments/Planned Programs Subtotals	16.455	29.392	3.750

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0604878C: *Aegis BMD Test*	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-
• 0901598C: *Management HQ - MDA*	27.065	26.902	24.102	-	24.102	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Sea-Based Weapon Systems 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 Sea-Based Weapon Systems program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MC09 / *Cyber Operations*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services	C/CPIF	Torch Technologies : Huntsville, AL	2.747	0.000		0.000		0.000		-		0.000	0.000	2.747	0.000
Network / System Certification and Accreditation (C&A) - Cyber TEAMs - MC09	C/CPFF	Booz Allen and Hamilton : McLean, VA	7.128	4.000	Nov 2019	2.815	Nov 2020	2.757	Nov 2021	-		2.757	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation - RMS	SS/CPAF	Raytheon : Tucson, AZ	0.000	0.000		1.486	Nov 2020	0.000		-		0.000	0.000	1.486	0.000
Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation	SS/CPAF	Lockheed Martin : Moorestown NJ	8.148	3.665	Nov 2019	5.672	Nov 2020	0.000		-		0.000	0.000	17.485	0.000
Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation - DISA	TBD	DISA : Falls Church, VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	0.000
Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation - PHD	MIPR	NSWC/PHD : Port Hueneme CA	0.501	0.000		0.000		0.000		-		0.000	0.000	0.501	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MC09 / *Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Network/System Certification and Accreditation - DD	MIPR	NSWC - DD : Dahlgren VA	1.300	0.000		0.000		0.000		-		0.000	0.000	1.300	0.000
Network / System Certification and Accreditation (C&A) - Program Operations - MC09 - CivSal	Allot	MDA : VA	0.343	0.000		0.707	Nov 2020	0.156	Nov 2021	-		0.156	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Security Operations - Secure Communications/ Equipment	C/CPFF	Jacobs Technology : TN	0.682	0.000		0.657	Nov 2020	0.837	Nov 2021	-		0.837	Continuing	Continuing	Continuing
RF Link Improvements - RF Link Improvements - Dahlgren	MIPR	NSWC-Dahlgren : Dahlgren, VA	0.000	0.000		1.453	Nov 2020	0.000		-		0.000	0.000	1.453	0.000
RF Link Improvements - RF Link Improvements - SM-3	SS/CPFF	Raytheon : Tucson, AZ	0.000	8.390	Mar 2020	15.567	Nov 2020	0.000		-		0.000	0.000	23.957	0.000
RF Link Improvements - RF Link Improvements - SM-3 APL	SS/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.293	Apr 2021	0.000		-		0.000	0.000	0.293	0.000
RF Link Improvements - RF Link Improvements - WS	SS/CPIF	Lockheed Martin : Moorestown, NJ	0.000	0.400	Mar 2020	0.742	Nov 2020	0.000		-		0.000	0.000	1.142	0.000
		Subtotal	20.949	16.455		29.392		3.750		-		3.750	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MC09 / *Cyber Operations*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.949	16.455		29.392		3.750		-		3.750	Continuing	Continuing	N/A

Remarks

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

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MC09 / *Cyber Operations*

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 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC09 Cyber Operations	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MC09 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC09 Cyber Operations	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MX09: *Aegis BMD Development Support*	527.151	151.772	148.030	136.506	-	136.506	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the completion of the Integrated Air and Missile Defense (IAMD) Cerebus Mission Planner upgrades.

A. Mission Description and Budget Item Justification

This includes the Government, contractor, and Federally Funded Research and Development Center (FFRDC) workforce that manage the overall Sea-Based Weapon Systems program and enables the program to develop, build, and test standard missiles and associated Aegis Weapons Systems. Sea-Based Weapon Systems, 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 Sea-Based Weapon Systems 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. Sea-Based Weapon Systems 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. Provides Fleet operations and mission support to enable the conduct of sustained BMD operation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Operations	86.636	82.685	85.575
Articles:	-	-	-
Description: This activity includes the Government, contractor, and FFRDC workforce that manage the overall Sea-Based Weapon Systems 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 2021 Plans: - SEE ABOVE.			
FY 2022 Plans: - SEE ABOVE			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
N/A			
Title: Aegis Ballistic Weapon System Support	18.891	24.594	22.123
Articles:	-	-	-
Description: Provides system engineering for fielded Sea-Based 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. Recurring Accomplishments: - Update threat adaptation data to keep pace with emergent threats - Provide operation and sustainment of land based test sites used for the development of Aegis BMD baselines. Operation and sustainment includes Engineering, Logistics, Quality Assurance, Configuration Management and other support activities to both baseline development and the sites. - Provide support for contingency operations of national interest - Support upgrades to fielded Aegis BMD computer programs baselines approved as an Operational Capacity Baseline - Provide engineering support to Operationally Capable Baseline ships that participate in BMD test events - Provide test site usage for maintenance and support of baselines under development - Sustain the classified computing infrastructure needed for development efforts Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Fleet Integration	21.468	24.702	17.444
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. Recurring Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Define, develop and review Joint and Fleet Doctrine for incorporation of Aegis BMD capability transition to warfighter and baseline acceptance into MDA 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 - 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 - Provide analysis for Anti-Ship Ballistic Missile Defense - Provide analysis on parametric organic sensor sensitivity - Provide analysis on up-range ship/sensor support for Launch on Remote (LoR), Engage on Remote (EoR), and Cued engagements - Provide analysis on impacts of countermeasures - Provide analysis on developing threats Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Provide optimization of multi-baseline/ship defense designs in order to accomplish force defense design planning. - Provide limited Anti-Air Warfare (AAW) depth of fire calculations. Navy BMD assets need to account for air threats that impact their ship operating area integrated BMD/AAW mission. - Deploy Maritime Tactical Command and Control (MTC2) cloud device for local storage and mission planning computing in order to support collaboration across ship networks (afloat-to-ashore) and future mission planning software and data library updates - Incorporate MTC2 into Aegis BMD Mission Planner Prototype (Cerberus) to provide multi-mission planning and de-confliction (BMD, air, surface, etc.) - Develop Capability Insertion and Requirements to resolve warfighter feedback design issues. Build warfighter requirement into current baseline on a more frequent schedule. - Mission Planner Integrated Product Team (IPT) Lead. Synchronizes mission planning efforts across the program. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the completion of the IAMD Cerebus Mission Planner upgrades.			
Title: Infrastructure Upgrades	24.777	16.049	11.364
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
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. Includes 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, replaces critical IT infrastructure at end-of-life and to implement DoD mandated projects in support of the Joint Information environment (JIE) initiative. Recurring accomplishments: - Procure and installation of two TI-16 Mod 1 Baseline 10 labs to support MDA Ground Testing commencing in FY22 - Procure and installation of two Detection Simulation (DETSIM) Emulators to support AN/APY-6 testing commencing in FY22 - Procure and installation of three Virtual Twin/VTE - IDIQ Contract # N002418F8622 / PR# 1300855404 commencing in FY22 - Establishment of Cooperative Engagement Capability (CEC) lab and interaction to Aegis BMD labs - Conduct Aegis IT services such as IT help-desk; portal and data services; records management; business automation services; and desktop and SPPN maintenance and licenses - Replacement of critical end-of-life equipment - Upgrades to IT infrastructure planning and implementation efforts to accomplish DoD mandated IT Projects (JIE and DoD Chief Information Officer (CIO) Information Resources Management (IRM) initiatives. ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - Develop, procure and install Combined Federated Battle Laboratories Network (CFBLNet) allowing MDACNET chat and voice capability - Develop, procure and install Program Executive Office Integrated Warfare Systems-Cyber (PEO IWS-C) Integrated Air and Missile Defense (IAMD) Risk Reduction Testing with IFF Senor and Tactical Air (TACAIR) capabilities ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects transition of BTS Hardware.			
Title: Joint Emerging Operational Need (JEON)	0.000	0.000	0.000
Articles:	-	-	-
Description: N/A			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	151.772	148.030	136.506

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C MD09: *MD09 Aegis BMD O&M*	74.642	79.913	68.293	-	68.293	-	-	-	-	-	-
• 0604878C: *Aegis BMD Test*	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Sea-Based Weapon Systems 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 Sea-Based Weapon Systems 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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Program Operations - MX09 - GSA Procurement for MDA Historical Project	C/CPFF	Gryphon Technologies : VA	0.000	0.316	May 2020	0.000		0.000		-		0.000	0.000	0.316	0.000
Program Operations - Program Operations - MX09 - Civ Sal	Allot	MDA : VA	62.087	29.613	Nov 2019	34.933	Nov 2020	32.567	Nov 2021	-		32.567	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - DD PM	MIPR	NSWC/DD : Dahlgren, VA	6.873	2.038	Nov 2019	1.696	Nov 2020	0.000		-		0.000	0.000	10.607	0.000
Program Operations - Program Operations - MX09 - IT	Various	MDA : VA, AL	3.189	1.249	Nov 2019	1.517	Nov 2020	1.255	Dec 2021	-		1.255	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - MDA Travel	Allot	MDA : VA	4.517	0.586	Nov 2019	1.737	Nov 2020	0.785	Oct 2021	-		0.785	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - NAVSEA Civ Sal	MIPR	NAVSEA : Washington, DC	27.294	11.309	Nov 2019	14.156	Nov 2020	14.688	Nov 2021	-		14.688	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - NAVSEA RB Sal	MIPR	NAVSEA : Washington, DC	4.858	2.352	Nov 2019	1.745	Nov 2020	1.797	Nov 2021	-		1.797	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - NAVSEA Training, Various	MIPR	NAVSEA : Washington, DC	1.586	0.016	Nov 2019	0.030	Nov 2020	0.030	Nov 2021	-		0.030	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - NAVSEA Travel	MIPR	NAVSEA : Washington, DC	2.186	0.310	Nov 2019	0.000		0.000		-		0.000	0.000	2.496	0.000
Program Operations - Program Operations - MX09 - Security	MIPR	Various : VA	1.778	0.055	Nov 2019	0.285	Nov 2020	0.300	Nov 2021	-		0.300	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - TEAMS	C/CPFF	Various : VA, AL	92.842	38.792	Nov 2019	26.586	Nov 2020	34.153	Nov 2021	-		34.153	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Ballistic Weapon System Support - MX09 - AW APL	SS/CPFF	JHU/APL : Columbia, MD	6.309	0.779	Nov 2019	0.929	Nov 2020	0.853	Nov 2021	-		0.853	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW DD	MIPR	NSWC DD : Dahlgren, VA	22.074	2.036	Nov 2019	3.768	Nov 2020	3.505	Nov 2021	-		3.505	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW LM	C/CPFF	Lockheed Martin : Moorestown, NJ	47.778	9.914	Nov 2019	2.284	Nov 2020	2.098	Nov 2021	-		2.098	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW NAVSEA	MIPR	NAVSEA : Washington, DC	56.793	4.763	Nov 2019	16.736	Nov 2020	14.861	Nov 2021	-		14.861	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW TECH REP	MIPR	Aegis Tech Rep : Moorestown, NJ	1.372	0.166	Nov 2019	0.470	Nov 2020	0.432	Nov 2021	-		0.432	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW Wallops	MIPR	SCSC : Wallops Island, VA	3.547	1.233	Nov 2019	0.407	Nov 2020	0.374	Nov 2021	-		0.374	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD Various	MIPR	Various : San Diego, CA	32.663	0.000		0.000		0.000		-		0.000	0.000	32.663	0.000
Aegis Ballistic Weapon System Support - MX09 - AW PHD	MIPR	NSWC PHD : Port Hueneme, CA	0.956	0.000		0.000		0.000		-		0.000	0.000	0.956	0.000
Fleet Integration - MX09 - ABS	MIPR	NIWC : San Diego, CA	0.000	2.000	Nov 2019	0.000		1.000	Nov 2021	-		1.000	Continuing	Continuing	Continuing
Fleet Integration - MX09 - ABS APL	SS/CPFF	JHU/APL : Columbia, MD	0.000	0.000		0.000		5.939	Nov 2021	-		5.939	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet APL	SS/CPFF	JHU/APL/MD : Columbia, MD	28.451	12.927	Nov 2019	13.074	Nov 2020	5.773	Nov 2021	-		5.773	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet DD	MIPR	NSWC DD : Dahlgren, VA	10.490	2.062	Nov 2019	2.632	Nov 2020	2.449	Nov 2021	-		2.449	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet PEO C41	MIPR	PEO C41 : San Diego, CA	2.002	2.002	Nov 2019	1.004	Nov 2020	0.000		-		0.000	0.000	5.008	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fleet Integration - MX09 - Fleet SMDC	MIPR	SMDC/ARSTRST : Huntsville, AL	1.909	1.048	Nov 2019	0.629	Nov 2020	0.630	Nov 2021	-		0.630	Continuing	Continuing	Continuing
Fleet Integration - MX09 - LM	C/CPFF	LM : VA	0.000	0.025	May 2020	5.710	Nov 2020	0.000		-		0.000	0.000	5.735	0.000
Fleet Integration - MX09 - Fleet CSCS	MIPR	CSCS : Dahlgren, VA	4.214	1.404	Nov 2019	1.653	Nov 2020	1.653	Nov 2021	-		1.653	Continuing	Continuing	Continuing
Infrastructure Upgrades - Infrastructure Upgrades - MX-09 S Jacobs	C/CPAF	Jacobs Engineering : AL, CA, CO, NM, VA, HI	0.096	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Infrastructure Upgrades - Infrastructure Upgrades MX-09 S Network	C/CPFF	Network Management Resources : Chantilly, VA	0.171	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - ICT Funding	C/CPAF	Jacobs Engineering : AL,CA,CO,NM,VA,HI	47.602	11.569	Nov 2019	11.662	Nov 2020	11.364	Nov 2021	-		11.364	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S	MIPR	SPAWAR : CA	0.446	0.000		0.000		0.000		-		0.000	0.000	0.446	0.000
Infrastructure Upgrades - MX09 - S APL	SS/CPAF	JHU/APL : Laurel, MD	1.797	5.160	Nov 2019	0.000		0.000		-		0.000	0.000	6.957	0.000
Infrastructure Upgrades - MX09 - S Corona	MIPR	NSWC Corona : Corona, CA	4.485	0.847	Nov 2019	0.000		0.000		-		0.000	0.000	5.332	0.000
Infrastructure Upgrades - MX09 - S LM	C/CPAF	Lockheed Martin : Moorestown, NJ	20.735	0.894	Nov 2019	0.000		0.000		-		0.000	0.000	21.629	0.000
Infrastructure Upgrades - MX09 - S MIT	C/CPAF	MIT : Lexington, MA	0.958	0.348	Nov 2019	0.000		0.000		-		0.000	0.000	1.306	0.000
Infrastructure Upgrades - MX09 - S RMS	C/CPAF	Raytheon : Tucson, AZ	5.820	1.100	Nov 2019	0.000		0.000		-		0.000	0.000	6.920	0.000
Infrastructure Upgrades - MX09- D/TD	MIPR	SPAWAR : CA	10.171	3.739	Nov 2019	4.387	Nov 2020	0.000		-		0.000	0.000	18.297	0.000
Infrastructure Upgrades - MX09- S DD	MIPR	NSWC DD : Dahlgren, VA	3.543	0.300	Nov 2019	0.000		0.000		-		0.000	0.000	3.843	0.000
Infrastructure Upgrades - MX09-Various	MIPR	Various : Various	0.759	0.820	Nov 2019	0.000		0.000		-		0.000	0.000	1.579	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Emerging Operational Need (JEON) - Joint Emerging Operational Needs Statement (JEON) - MX09 AW JHU/APL	SS/CPFF	JHU/APL : Columbia, MD	0.480	0.000		0.000		0.000		-		0.000	0.000	0.480	0.000
Joint Emerging Operational Need (JEON) - Joint Emerging Operational Needs Statement (JEON) - MX09 AW Lockheed Martin	C/CPFF	Lockheed Martin : Moorestown, NJ	3.635	0.000		0.000		0.000		-		0.000	0.000	3.635	0.000
Joint Emerging Operational Need (JEON) - Joint Emerging Operational Needs Statement (JEON) - MX09 AW NSWC	MIPR	NSWC DD : Dahlgren, VA	0.685	0.000		0.000		0.000		-		0.000	0.000	0.685	0.000
		Subtotal	527.151	151.772		148.030		136.506		-		136.506	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	527.151	151.772		148.030		136.506		-		136.506	Continuing	Continuing	N/A

Remarks

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

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
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 ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MX09 Aegis BMD Development Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
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

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MX09 Aegis BMD Development Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	349.658	25.848	30.503	30.095	-	30.095	-	-	-	-	-	-
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 MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS 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 worldwide. 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 across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; 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 2020	FY 2021	FY 2022
Title: Program Wide Support	25.848	30.503	30.095
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS 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 worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
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 2020	FY 2021	FY 2022
inventory of facilities in good working order; 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. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	25.848	30.503	30.095

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	3.239	0.423	Jul 2020	0.000		0.000		-		0.000	0.000	3.662	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries	Various	MDA : Multi: AK, AL, CO, CA, VA	271.494	23.547	Oct 2019	24.791	Oct 2020	30.095	Oct 2021	-		30.095	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	0.152	Jan 2020	0.235	Oct 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	39.256	1.726	Jul 2020	5.477	Jul 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	4.690	0.000		0.000		0.000		-		0.000	0.000	4.690	0.000
		Subtotal	349.658	25.848		30.503		30.095		-		30.095	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	349.658	25.848		30.503		30.095		-		30.095	Continuing	Continuing	N/A

Remarks

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

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
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 ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.