Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Missile Defense Agency	Date: March 2024
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603176C *I Advanced Concepts and Performance Assessment*

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	204.633	39.293	17.825	17.920	-	17.920	39.210	58.477	67.637	72.697	Continuing	Continuing
MD71: *Advanced Concepts and Performance Assessments*	121.133	31.147	13.386	13.320	-	13.320	33.566	51.977	60.448	65.073	Continuing	Continuing
MD40: *Program-Wide Support*	4.828	0.608	0.634	0.690	-	0.690	1.657	2.433	3.041	3.393	Continuing	Continuing
MC71: *Cyber Operations*	78.672	7.538	3.805	3.910	-	3.910	3.987	4.067	4.148	4.231	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The Advanced Concepts and Performance Assessment (ACPA) Program Element delivers a government concept that integrates concept definition, simulation, analysis, and testbed capability. ACPA's focus is on the exploration of novel and/or emerging capabilities that may have the potential to enhance the Missile Defense System. ACPA centralizes assessment of advanced missile defense technology and delivers insight into the performance of proposed concepts extending the Missile Defense Agency's (MDA) ability to address evolving threats for the Warfighter. Working with national laboratories and industry, MDA will invest in the analysis and assessment of directed energy system components to determine their effectiveness and capability for missile defense.

Subject Matter Experts provide independent assessments of government, university, and industry technology concepts, used in concert with systems engineering requirements, to support acquisition strategy decisions and define technology focus areas. The innovative structured concept definition and assessment methodology enables MDA to quickly validate focus areas, verify contractor technology solutions, and evaluate promising concepts in future Missile Defense System architectures. This methodology significantly enhances MDA's ability to assess technology concepts while decreasing the cost of development by:

- Delivering Independent model-based simulations of industry technology concepts to inform the systems engineering process
- Quantifying expectations through algorithms, digital simulation, hardware-in-the-loop, and/or demonstration events prior to expensive live fire test events
- Executing end-to-end testing of technology concepts integrated with weapon systems through Command and Control network architectures
- Maturing and conducting assessments of new technologies to evaluate their readiness for transition to the future Missile Defense System
- Supports early coordination with the program elements to promote efficient integration into the Missile Defense System and provide additional capability to meet the Warfighter needs

Performance assessment of advanced concepts is the key enabler for government evaluation of technology in the earliest stages of development and maximizes the efficiency of technology investments. Performance assessment is used to quantify capability expectations of innovative concepts to counter the expanding regional and homeland missile threats, including ballistic and cruise missiles, and hypersonic vehicles.

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Missile Defense Agency	Date: March 2024
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603176C *I Advanced Concepts and Performance Assessment*

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	39.737	17.825	18.301	-	18.301
Current President's Budget	39.293	17.825	17.920	-	17.920
Total Adjustments	-0.444	0.000	-0.381	-	-0.381
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.300	0.000			
• Other Adjustment	-0.144	0.000	-0.381	-	-0.381

Change Summary Explanation

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2025 Missile Defense Agency			Date: March 2024
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / *Advanced Concepts and Performance Assessment*	Project (Number/Name) MD71 / *Advanced Concepts and Performance Assessments*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
MD71: *Advanced Concepts and Performance Assessments*	121.133	31.147	13.386	13.320	-	13.320	33.566	51.977	60.448	65.073	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Advanced Concepts and Performance Assessments (ACPA) centralizes advanced technology concept modeling, simulation, software, and analysis. Integrating models of promising disruptive technical solutions into Missile Defense System system-level simulations enables leadership to make data driven acquisition and technology investment decisions. Assess concepts that improve or adapt existing systems, that incorporate mobile sensors and interceptors that can be surged into zones of crisis or conflict are also deemed disruptive. Examples of efforts required to quantify the contribution of disruptive technologies may include, but not be limited to environmental experimentation and phenomenological characterization required for new sensor concepts, advanced weapon technologies, and emerging directed energy concepts. Using a technology development testbed approach, ACPA enables assessment and characterization of incremental technology improvements to inform requirements and evaluate missile defense elements, components, and/or sub-component technologies and to assess maturity as it relates to readiness for transition to the future Missile Defense System. ACPA promotes informed decision making early in the acquisition life-cycle to maximize investments and successful transition into the Missile Defense System.

Coupled with characterization efforts, ACPA develops innovative left-through-right-of-launch modeling capabilities including physics-based representations in the areas of cyber, sensor technologies, lethality and survivability, communications, and sensor support. ACPA is focusing on Science and Technology initiatives which increase interoperability and leverages expertise with allied and service partners.

ACPA capitalizes on the innovation of small businesses, universities, Federally Funded Research and Development Centers (FFRDCs), and University Affiliated Research Centers (UARCs) to pursue a broad range of hardware, software, models, algorithms, trade studies, and analysis. These innovations bring together government developed models representing existing and future missile defense architectures, technology concepts, and advanced algorithms to provide detailed assessments of concept performance and inform investment decisions. These innovations, combined with a robust high performance computing infrastructure, provide a unique in-house government capability to demonstrate and assess technology concepts for emerging technology risk reduction, to mature concepts with laboratory, ground, and flight test data, and where possible, apply concepts in simulated exercises with weapon systems across representative communication architectures.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025
Title: Advanced Concepts and Performance Assessment	16.147	13.386	13.320
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2025 Missile Defense Agency		Date: March 2024
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603176C / *Advanced Concepts and Performance Assessment*	**Project (Number/Name)** MD71 / *Advanced Concepts and Performance Assessments*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025
Description: Provide quantitative assessments that define the benefits of technology investments and inform requirements using an integrated concept definition, simulation, and performance analysis capability. A staff of diverse Subject Matter Experts delivers independent government performance evaluations which exercise kinetic and non-kinetic missile defense concept representations against the broad spectrum of evolving threats. - Assess electro-optical infrared and advanced sensor technologies and quantify impacts on Missile Defense System to address future threat capabilities - Provide independent government assessments of industry sensor, directed energy and weapon system technology concepts, and the ability of these systems to be integrated for a more effective Missile Defense System - Evaluate lethality impacts and weapons effectiveness of emerging concepts - Examine pathfinder solutions and demonstrate the utility of directed energy for missile defense - Study on-orbit satellite capabilities and contribution to defense against advanced threats - Assess and identify promising intercept capabilities across all phases of flight - Perform concept performance against emerging advanced threats including hypersonic threat testing scenarios - Mature advanced technology concepts in a testbed environment and through lab, ground, and flight demonstrations - Apply concepts in simulated exercises with weapon systems - Work with the Missile Defense System Architect and Missile Defense Agency (MDA) Systems Engineer to design concepts, build models and assess technology concepts' contributions to future Missile Defense System architectures - Develop and extend modeling techniques, including incorporation of artificial intelligence - Focus research and engineering activities from university and small business partners to identify suitable technology and concepts that improve Missile Defense System performance through a rapid innovation model based on an engineering test bed - Assess multi-domain data fusion concept for current or future weapon systems Specific and/or unique accomplishments to each FY are as follows: ***FY 2024 Plans:*** - SEE ABOVE ***FY 2025 Plans:*** - SEE ABOVE ***FY 2024 to FY 2025 Increase/Decrease Statement:*** N/A			
Title: Hypersonic Hardware-in-the-Loop	15.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2025 Missile Defense Agency		Date: March 2024
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603176C / *Advanced Concepts and Performance Assessment*	**Project (Number/Name)** MD71 / *Advanced Concepts and Performance Assessments*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025
Articles:	-	-	-
Description: Develop an independent government hypersonic testbed supporting assessment and maturation of industry and/or government technology approaches. Leverage existing facilities and extend ballistic and/or hypersonic kill vehicle hardware-in-the-loop (HWIL) by integrating with evolving hypersonic sensor HWIL capabilities. Provide a prototype platform consisting of technologies necessary to evaluate the potential of new kill vehicle concepts to identify, track, and engage emerging threats; including vehicles with dynamically changing aerothermal signatures. Assess, mature, and integrate high-fidelity environmental truth models and/or representations for aerothermal, aero-optics and/or jet interaction for hypersonic flight environments to provide accurate simulations for digital scene injections into kill vehicle concept representations in HWIL facilities. Bolster prototype development and maturation by upgrading hypersonic HWIL capabilities through pathfinder process integrating agile continuous integration and/or continuous delivery capabilities. ***FY 2024 Plans:*** N/A ***FY 2025 Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	31.147	13.386	13.320

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• 0603180C: *Advanced Research*	84.996	21.461	19.354	-	19.354	23.432	24.863	26.418	26.894	Continuing	Continuing

Remarks

D. Acquisition Strategy

Utilize various contracting strategies with small businesses, FFRDCs, UARCs, and other Government Agencies to maximize the contribution to MDA and inform Better Buying Power acquisition decisions.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Missile Defense Agency			Date: March 2024
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / *Advanced Concepts and Performance Assessment*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	4.828	0.608	0.634	0.690	-	0.690	1.657	2.433	3.041	3.393	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire Missile Defense System. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the Missile Defense System 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.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Missile Defense Agency			Date: March 2024
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / *Advanced Concepts and Performance Assessment*	Project (Number/Name) MC71 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
MC71: *Cyber Operations*	78.672	7.538	3.805	3.910	-	3.910	3.987	4.067	4.148	4.231	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

This project supports the monitoring and tracking of Cybersecurity mitigations as required in the Department of Defense (DoD) Instruction Number 8510.01, as amended which establishes Risk Management Framework (RMF) requirements for DoD Information Technology (IT). Funds in this project implement and sustain DoD-required RMF and associated Controls Validation Testing activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance System Security Manager Plans of Action and Milestones (POAMs) for enabling modeling and simulation mission systems. This project captures the RMF documentation (artifacts, validation results, Information Assurance (IA) risk assessment results, and the Missile Defense Agency (MDA) Authorizing Official and Chief Information Officer accreditation decisions) into the Defense Information Systems Agency's Enterprise Mission Assurance Support Service system. Hardware and software upgrades required to meet DoD standards are supported by funding in this project. Independent verification and validation team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the project are necessary to comply with the Federal Information Security Management Act.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025
Title: Information Assurance / Cyber Network Defense	7.538	3.805	3.910
Articles:	-	-	-
Description: Funds RMF, network defense, and information technology requirements including: - Conduct Cybersecurity and/or IA engineering and architecture planning - Maintain hardware and/or software currency to meet DoD-mandated cybersecurity requirements - Support monitoring and tracking of Cybersecurity mitigations detailed in IT security POAM - Develop DoD RMF certification and accreditation packages - Conduct controls validation testing of systems and to provide POAM to mitigate IA deficiencies - Conduct annual IA reviews to assess compliance in implementing and maintaining IA controls Specific and/or unique accomplishments to each FY are as follows:			
FY 2024 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Missile Defense Agency		Date: March 2024
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603176C / *Advanced Concepts and Performance Assessment*	**Project (Number/Name)** MC71 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025
- SEE ABOVE ***FY 2025 Plans:*** - SEE ABOVE ***FY 2024 to FY 2025 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	7.538	3.805	3.910

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A