Department of Defense
Fiscal Year (FY) 2024 Budget Estimates

March 2023

Defense Threat Reduction Agency

Defense-Wide Justification Book Volume 5 of 5

Research, Development, Test & Evaluation, Defense-Wide

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Volumes

Volume 5 Table of Contents

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-1, RDT&E Programs
Defense Threat Reduction Agency
Fiscal Year (FY) 2024 Budget Estimates

Appropriation: RDT&E,Defense-Wide **Date: March 2023**

Overview

The United States faces a highly competitive security environment characterized by diverse and dynamic weapons of mass destruction (WMD) risks across multiple domains. Moreover, the complexity of state-based chemical, biological, radiological, and nuclear (CBRN) threats is increasing, compounded by advanced and emerging technologies that can provide adversary WMD programs greater speed, lethality, flexibility, accessibility, and deniability. Revisionist powers, primarily China and Russia, seek to degrade international norms while expanding and modernizing their nuclear forces, diversifying advanced conventional systems, and developing CBRN capabilities designed to exploit U.S. and allied vulnerabilities—including in the gray zone short of direct military conflict. While the threat posed by Russia is acute, China—with its rapid strategic military expansion across the CBRN spectrum, integrative approach to advanced technical capabilities, and aggressive regional posture—remains the pacing challenge. Simultaneously, Iran and North Korea are pursuing advanced warfighting capabilities that undermine regional security and global stability in ways that can pose considerable risk to U.S. strategy and priorities. Additionally, the potential for natural or accidental release of biological or chemical threat agents contributes to an ever-evolving CBRN threat environment.

The Defense Threat Reduction Agency (DTRA) Fiscal Year 2024-2028 budget submission invests in the capabilities and expertise necessary to enable the Department of Defense (DoD), the U.S. Government, and international partners to deter and prevent these present and emerging WMD threats, while ensuring U.S. forces prevail in conflict with a WMD-armed adversary.

DTRA's strategic priorities are fully aligned with the priorities of the *National Defense Strategy* (NDS), the *Nuclear Posture Review* (NPR), and other strategic guidance documents that direct DoD to meet our national security goals through integrated deterrence, campaigning, and building enduring advantages. As both a Defense Agency and Combat Support Agency, DTRA provides cross-cutting countering weapons of mass destruction (CWMD) solutions. DTRA enables the Department to shape the operating environment and reduce risk to national security objectives, providing technologies and integrated deterrence solutions for the most intractable WMD problems. DTRA supports whole-of-government efforts to prevent the acquisition, proliferation, and use of WMD and associated materials and to confound the decision calculus of WMD-armed adversaries.

The Agency's core missions support and enable DoD's ability to:

- Deter strategic attack against the United States and its allies;
- Prevent, reduce, and counter WMD and emerging threats; and
- Prevail against WMD-armed adversaries in crisis and conflict.

DTRA's dual roles as a Defense and Combat Support Agency help the Agency provide cross-cutting CWMD solutions to support each of these mission priorities. DTRA is committed to achieving concrete outcomes and strategic effects through its five core functions:

- Ensuring a reliable, resilient strategic deterrent through nuclear surety, mission assurance, and crisis response activities;

- Developing and delivering innovative capabilities to the warfighter across the threat spectrum;
- Preventing, reducing, and eliminating CBRN threats through risk reduction, arms control, partner capacity building, and warfighter support;
- Providing strategic and operational support through subject matter expertise, technical reachback, tailored analysis, and exercise support;
- Supporting the Joint Force with plans, concepts, exercises, and materiel solutions to address CBRN operational and strategic risks.

Over the next five years, DTRA will sustain focus on its vital support to the CCMDs, while applying renewed energy toward our Defense Agency role in both new and traditional ways. Cross-agency integration, proactive posturing, and effective partnering approaches—all in support of a campaign-based approach— will allow DTRA to tackle the toughest problems with whole-of-agency solutions that build enduring advantages across the strategic deterrence and counter-WMD enterprise.

For CCMDs and other Joint Force partners, DTRA remains focused on developing and delivering the methodologies and capabilities required to address WMD threats—specifically those posed by China, Russia, North Korea, and Iran. Such counter-WMD capabilities reinforce integrated deterrence by compounding the adversaries' threat calculus while also reducing risks to the Joint Warfighter. Given the CBRN-related operational risks posed by China and Russia, as well as by North Korea and Iran, DTRA must be ready to rapidly respond in crisis and retain its ability to posture sustainable effective support for crisis and conflict, both at home and abroad.

DTRA will strengthen relationships within DoD and with key interagency partners to produce whole-of-government solutions, with renewed emphasis on our efforts to collaborate and integrate with allies and partners in ways that create enduring advantages for DoD. DTRA will emphasize risk reduction initiatives that include future arms control implementation, nuclear deterrence support, partner capacity-building, and technological solution development. Through continuous and proactive engagement with DoD, interagency and international partners, DTRA will build the campaigning approaches necessary to prevent and deter WMD threats and, if necessary, prevail against WMD-armed adversaries.

DTRA will be proactive in sharing information, anticipating threats within the information environment, and supporting activities that allow the DoD and its allies and partners to characterize and attribute WMD-related events and disinformation campaigns. Increasing transparency and anticipating potential vulnerabilities within our strategic message will build resiliency, counter disinformation efforts from our adversaries, and strengthen current and future U.S. alliances.

DTRA must fully leverage and empower the rich talent and expertise across this Agency to put tools, resources, and capabilities into the hands of policy makers and operators. A renewed emphasis on recruiting and retaining a diverse and highly skilled workforce will ensure the Agency can sustain the human capital advantage for meeting the CWMD challenges of the future.

The Research, Development, Test, and Evaluation (RDT&E) portfolio is risk balanced to support the NDS and NPR. It also addresses complex WMD threat problems for the warfighter, including understanding the environment, threats, and vulnerabilities; controlling, defeating, disabling, and disposing of threats; and enhancing DoD's ability to safeguard the force and manage consequences and outcomes. DTRA accomplishes this through five integrated thrust areas:

- **Understand emerging WMD situations, threats, and capabilities:** Improve nuclear and radiological hazard assessment techniques, methodologies, and analytic tools (including the use of high-confidence modeling);
- **Deny adversary benefits of WMD use:** Develop and innovate technologies and concepts of operation that enable survivable,

hardened, and resilient conventional forces, which deter adversaries from WMD use;

- **Control, reduce, disable, and defeat WMD and emerging threats:** Develop and improve direct or indirect physical or functional defeat of WMD threats, as well as capabilities that render adversary WMD programs and systems inoperable, harmless, or nonexistent prior to weapon employment through cooperative and non-cooperative approaches;
- **Protect the force and mitigate crisis from WMD:** Protect mounted and dismounted forces, reduce casualties, and degrade adversaries' abilities to disrupt operations using chemical, biological, nuclear, and emerged threats attacks; and
- **Enable cross-cutting capabilities:** Model system vulnerabilities and the effects of CBRN warfare on existing networks and infrastructure, as well as the compounding and cascading consequences across dependent networks with complex post-attack/detonation timelines; and improve test instrumentation capability and capacity for test data capture, integration, and use.

THIS PAGE INTENTIONALLY LEFT BLANK

Department of Defense
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation	FY 2022 Actuals	FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment	FY 2024 Request
Research, Development, Test and Evaluation, Defense-Wide	645,430	667,363		667,363	686,545
Total Research, Development, Test, & Evaluation	**645,430**	**667,363**		**667,363**	**686,545**

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

Department of Defense
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

	FY 2022 Actuals	FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment	FY 2024 Request
Summary Recap of Budget Activities					
Basic Research	11,519	16,584		16,584	14,761
Applied Research	191,050	191,632		191,632	208,870
Advanced Technology Development	399,961	413,226		413,226	418,937
Advanced Component Development & Prototypes	6,979	7,130		7,130	8,328
System Development & Demonstration	35,921	28,496		28,496	23,730
Management Support		10,295		10,295	11,919
Total Research, Development, Test, & Evaluation	**645,430**	**667,363**		**667,363**	**686,545**
Summary Recap of FYDP Programs					
Research and Development	645,430	667,363		667,363	686,545
Total Research, Development, Test, & Evaluation	**645,430**	**667,363**		**667,363**	**686,545**

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

Defense-Wide
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

	FY 2022 Actuals	FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment	FY 2024 Request
Summary Recap of Budget Activities					
Basic Research	11,519	16,584		16,584	14,761
Applied Research	191,050	191,632		191,632	208,870
Advanced Technology Development	399,961	413,226		413,226	418,937
Advanced Component Development & Prototypes	6,979	7,130		7,130	8,328
System Development & Demonstration	35,921	28,496		28,496	23,730
Management Support		10,295		10,295	11,919
Total Research, Development, Test, & Evaluation	**645,430**	**667,363**		**667,363**	**686,545**
Summary Recap of FYDP Programs					
Research and Development	645,430	667,363		667,363	686,545
Total Research, Development, Test, & Evaluation	**645,430**	**667,363**		**667,363**	**686,545**

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

Defense-Wide
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation	FY 2022 Actuals	FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment	FY 2024 Request
Defense Threat Reduction Agency	645,430	667,363		667,363	686,545
Total Research, Development, Test and Evaluation, Defense-Wide	645,430	667,363		667,363	686,545

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

Defense-Wide
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 0400D Research, Development, Test and Evaluation, Defense-Wide

Line No	Program Element Number	Item	Act	Sec	FY 2022 Actuals	FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment
1	0601000BR	DTRA Basic Research	01	U	11,519	16,584		16,584
	Basic Research				**11,519**	**16,584**		**16,584**
23	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	U	191,050	191,632		191,632
	Applied Research				**191,050**	**191,632**		**191,632**
33	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	U	399,961	406,721		406,721
34	0603176BR	Advanced Concepts and Performance Assessment	03	U		6,505		6,505
39	0603260BR	Intelligence Advanced Development	03	U				
	Advanced Technology Development				**399,961**	**413,226**		**413,226**
105	0604551BR	Catapult Information System	04	U	6,979	7,130		7,130
	Advanced Component Development & Prototypes				**6,979**	**7,130**		**7,130**
134	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	U	13,695	14,403		14,403
141	0605141BR	Mission Assurance Risk Management System (MARMS)	05	U	5,356	14,093		14,093
144	0605502BR	Small Business Innovation Research	05	U	16,870			
	System Development & Demonstration				**35,921**	**28,496**		**28,496**
187	0606853BR	Management, Technical & International Support	06	U		10,295		10,295
	Management Support					**10,295**		**10,295**
Total Research, Development, Test and Evaluation, Defense-Wide					**645,430**	**667,363**		**667,363**

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

Defense-Wide
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 0400D Research, Development, Test and Evaluation, Defense-Wide

Line No	Program Element Number	Item	Act	Sec	FY 2024 Request
1	0601000BR	DTRA Basic Research	01	U	14,761
	Basic Research				**14,761**
23	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	U	208,870
	Applied Research				**208,870**
33	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	U	400,947
34	0603176BR	Advanced Concepts and Performance Assessment	03	U	7,990
39	0603260BR	Intelligence Advanced Development	03	U	10,000
	Advanced Technology Development				**418,937**
105	0604551BR	Catapult Information System	04	U	8,328
	Advanced Component Development & Prototypes				**8,328**
134	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	U	14,414
141	0605141BR	Mission Assurance Risk Management System (MARMS)	05	U	9,316
144	0605502BR	Small Business Innovation Research	05	U	
	System Development & Demonstration				**23,730**
187	0606853BR	Management, Technical & International Support	06	U	11,919
	Management Support				**11,919**
Total Research, Development, Test and Evaluation, Defense-Wide					**686,545**

Defense Threat Reduction Agency
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 0400D Research, Development, Test and Evaluation, Defense-Wide

Line No	Program Element Number	Item	Act	Sec	FY 2022 Actuals	FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment
1	0601000BR	DTRA Basic Research	01	U	11,519	16,584		16,584
	Basic Research				**11,519**	**16,584**		**16,584**
23	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	U	191,050	191,632		191,632
	Applied Research				**191,050**	**191,632**		**191,632**
33	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	U	399,961	406,721		406,721
34	0603176BR	Advanced Concepts and Performance Assessment	03	U		6,505		6,505
39	0603260BR	Intelligence Advanced Development	03	U				
	Advanced Technology Development				**399,961**	**413,226**		**413,226**
105	0604551BR	Catapult Information System	04	U	6,979	7,130		7,130
	Advanced Component Development & Prototypes				**6,979**	**7,130**		**7,130**
134	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	U	13,695	14,403		14,403
141	0605141BR	Mission Assurance Risk Management System (MARMS)	05	U	5,356	14,093		14,093
144	0605502BR	Small Business Innovation Research	05	U	16,870			
	System Development & Demonstration				**35,921**	**28,496**		**28,496**
187	0606853BR	Management, Technical & International Support	06	U		10,295		10,295
	Management Support					**10,295**		**10,295**
Total Defense Threat Reduction Agency					**645,430**	**667,363**		**667,363**

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

Defense Threat Reduction Agency
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Mar 2023

Appropriation: 0400D Research, Development, Test and Evaluation, Defense-Wide

Line No	Program Element Number	Item	Act	Sec	FY 2024 Request
1	0601000BR	DTRA Basic Research	01	U	14,761
	Basic Research				**14,761**
23	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	U	208,870
	Applied Research				**208,870**
33	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	U	400,947
34	0603176BR	Advanced Concepts and Performance Assessment	03	U	7,990
39	0603260BR	Intelligence Advanced Development	03	U	10,000
	Advanced Technology Development				**418,937**
105	0604551BR	Catapult Information System	04	U	8,328
	Advanced Component Development & Prototypes				**8,328**
134	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	U	14,414
141	0605141BR	Mission Assurance Risk Management System (MARMS)	05	U	9,316
144	0605502BR	Small Business Innovation Research	05	U	
	System Development & Demonstration				**23,730**
187	0606853BR	Management, Technical & International Support	06	U	11,919
	Management Support				**11,919**
Total Defense Threat Reduction Agency					**686,545**

Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

THIS PAGE INTENTIONALLY LEFT BLANK

Program Element Table of Contents (Alphabetically by Program Element Title)

THIS PAGE INTENTIONALLY LEFT BLANK

ACRONYMS

A2TD	Automated Advanced Targeting Development
AD	Agent Defeat
ADMB	Agent Defeat Modeling and Simulation Modeling
AI/ML	Artificial Intelligence/Machine Learning
ANTS	Attack the Network Tool Suite
ATAC	Advanced Targeting Assessment Capability
ATD	Advanced Technology Development
AWeS	Auto-Weaponeering System
BAA	Broad Agency Announcement
CBRNE	Chemical, Biological, Radiological, Nuclear, and High-yield Explosives
CCDR	Combatant Commander
CCMD	Combatant Command
C-IED	Counter-Improvised Explosive Device

CNTN	Combatant Command Countering Nuclear Threat Network
COE	Consequence of Execution
CoE-NI	Consequence of Execution – Nuclear Integration
CONOPS	Concept of Operations
CONUS	Continental U.S
C-sUAS	Counter-Small Unmanned Aerial Systems
CT/CP	Counterterrorism/Counterproliferation
CTBT	Comprehensive Nuclear Test Ban Treaty
CTS	Component Test Structure
C-UAS	Counter-Unmanned Aerial System
CWMD	Countering Weapons of Mass Destruction
CWMD-T	Combating Weapons of Mass Destruction –Terrorism
DAPSS	Denied Area Persistent Sensor System
DEL	DTRA Experimentation Lab
DIAMONDS	Defense Integration and Management of Nuclear Data Services
DIOCC/DIA	Defense Intelligence Operations Coordination Center/Defense Intelligence Agency

DITEC	DTRA Integration Technical Experimentation Center
DoD	Department of Defense
DPPG	Defense Policy and Planning Guidance
DRDC	Defense Research and Development Canada
DSCS	Defense Satellite Communications System
DT&E	Development, Test, and Evaluation
DTRA	Defense Threat Reduction Agency
DTRIAC	Defense Threat Reduction Information Analysis Center
ECA	Enhanced Consequence Analysis
ECBC	Edgewood Chemical Biological Center
EM-1	Capabilities of Nuclear Weapons: Effects Manual Number 1
EMP	Electromagnetic Pulse
EMREP	Electromagnetic Reliability and Effects Predictions
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ERDC	U. S. Army Engineer Research and Development Center

FeFET	Ferroelectric Field Effect Transistors
FEFLO	Finite Element Flow Solver
FFRDC	Federally Funded Research and Development Center
FOC	Full Operational Capability
FREAK	Force-on-Force Evaluation and Analysis of Key Performance Parameters
FYDP	Future Years Defense Program
GBSD	Ground-Based Strategic Deterrent
HDBT	Hard and Deeply Buried Target
HPAC	Hazardous Prediction and Assessment Capabilities
HPC	High Performance Computing
HREIOR	High Resolution Electro-Optical Infrared Camera
HTD	Hard Target Defeat
HWIL	Hardware-in-the-Loop
IED	Improvised Explosive Device
IIRM	Interaction of Ionizing Radiation with Matter
IMAAC	Interagency Modeling and Atmospheric Assessment Center

IMEA	Integrated Munitions Effects Assessment
IMS	International Monitoring System
IoT	Internet of Things
IR	Infrared
ISS	Integrated Sensor System
IT	Information Technology
JOC	Joint Operations Center
JWICS	Joint Worldwide Intelligence Communications System
LAMP	Loop-mediated Isothermal Amplification
LBTS	Large Blast Thermal Simulator
LLE	Laboratory for Laser Energetics
LLNL	Lawrence Livermore National Laboratory
LTRI	Left-to-Right-of-Launch
M&S	Modeling and Simulation
MACS	Modular Autonomous Countering WMD System
MAGICS	Modular Airborne Gaseous Isotope Collection System

MCAPS	Mobile C-sUAS Airborne Platform Suite
MDA	Missile Defense Agency
MFO	Microwave Frequency Oscillator
MIL-HDBK	Military Handbook
MIL-STD	Military Standard
MINES	Mission Impact of Nuclear Effects Software
MIT	Mission Information Technology
MSEE	Materials Science in Extreme Environments
NACT	Nuclear Arms Control Technology
NAIMLE	Artificial Intelligence/Machine Learning Environment (NAIMLE)
NBCRV	Nuclear Biological Chemical Reconnaissance Vehicle
NCBRE	Nuclear, Chemical, Biological, Radiological, and High-Yield Explosive
NIEM	National Information Exchange Model
NIPR	Non-classified Internet Protocol Router
NLAN	Non-classified Local Area Network
NTM	Improved National Technical Means (NTM)

NuCS	Nuclear Capabilities Services
NWE	Nuclear Weapons Effects
OGA	Other Governmental Agencies
QRC	Quick Reaction Capabilities
RN	Radiological-nuclear
SAR	Synthetic Aperture Radar
SIPR	Secret Internet Protocol Router
SPIDA	Spectral Polarmetric Instrument Data Analysis
SPINS	Standoff Portable Isotopic Neutron Spectroscopy
sUAS	Small Unmanned Aerial Systems
TTP	Tactics, Techniques, and Procedures
TWAC	Targeting Weaponeering Assistance Cell
TXL	Transportable Xenon Laboratory
UAS	Unmanned Aerial Systems
UCP	Unified Command Plan
UGF	Underground Facility

UGT	Underground Test
UK	United Kingdom
URA	University Research Alliance
USANCA	U.S. Army Nuclear and Combating WMD Agency
USEUCOM	U.S. European Command
USFK	U.S. Forces Korea
USG	U.S. Government
USNORTHCOM	U.S. Northern Command
USPACOM	U.S. Pacific Command
USSOCOM	U.S. Special Operations Command
USSTRATCOM	U.S. Strategic Command
UTAS	Underground Targeting and Analysis System
V&V	Verification and Validation
VAPO	Vulnerability Assessment and Protection Option
VEO	Violent Extremist Organization
VIPER	Vehicle Integrated Platform Enhanced Radiac

VIRTUS	Virtual Radiation Training Through Ubiety System
VMS	Virtual Management System
VR/AR	Virtual Reality/Augmented Reality
WEP	Weapon Effects Phenomenology
WMD	Weapons of Mass Destruction
WSMR	White Sands Missile Range

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601000BR / *DTRA BASIC RESEARCH*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	401.058	11.519	16.584	14.761	-	14.761	15.311	15.897	16.498	17.128	Continuing	Continuing
RU: *BASIC RESEARCH FOR COUNTERING WMD*	401.058	11.519	16.584	14.761	-	14.761	15.311	15.897	16.498	17.128	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Basic Research for Countering WMD project, as the nation's primary basic research portfolio dedicated to countering weapons of mass destruction (CWMD), is a core strategic investor in future scientific and technological progress across the Defense Threat Reduction Agency's (DTRA) mission areas. This project concentrates on high-risk, high-payoff basic research, leveraging world-class expertise in academia, government, and industry, to increase the foundational body of scientific knowledge supporting DTRA's Applied Research and Advanced Technology Development projects.

This project aligns with DTRA's strategic objectives that support policy and planning guidance from the Executive Office of the President, the DoD, and the broader WMD threat reduction community. The portfolio addresses this guidance through capability enhancements, projects, and Science and Technology (S&T) investments that support CWMD. Specifically, they include: accelerating the development of standoff radiological/nuclear detection capabilities; securing vulnerable materials; defeating WMD agents; strategic radiation hardened microelectronics; and leveraging science, technology, and innovation through domestic partnerships and agreements.

This project solicits, coordinates, and conducts research to build a robust, forward-looking fundamental research portfolio targeting strategic, mission-focused, basic research with high potential impact for CWMD. The research projects are selected for scientific merit, technical quality, and the potential for innovation. Each research project offers opportunities to expand the knowledge base to help the warfighter, to bring to bear new science solutions with a fresh approach, or to leverage revolutionary approaches to technical surprise, building a foundation for future CWMD solutions. This research will enable new capabilities to control, defeat, disable, and/or dispose of WMD threats.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601000BR / *DTRA BASIC RESEARCH*

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	11.828	11.584	11.715	-	11.715
Current President's Budget	11.519	16.584	14.761	-	14.761
Total Adjustments	-0.309	5.000	3.046	-	3.046
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.309	0.000			
• Realignments	-	-	3.046	-	3.046

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: RU: *BASIC RESEARCH FOR COUNTERING WMD*		
Congressional Add: *Materials Science in Extreme Environments*	-	5.000
Congressional Add Subtotals for Project: RU	-	5.000
Congressional Add Totals for all Projects	-	5.000

Change Summary Explanation

The increase in FY 2024 from the previous President's Budget funds additional post-doctoral expertise while expanding basic research activities in the University Research Alliances (URAs). Additional resources fund enhancements for strategic competition to sustain global scientific enduring advantage in support of future warfighting. This will enable fundamental research in nuclear detonation plume modeling and radiological signature analysis to leverage novel Machine Learning techniques and automate discovery and manufacturing of new radiation-sensitive materials, reducing the cost of deployed radiation detectors by a factor of 10. This increase is funded predominately by decreased investment in Project RR: Countering WMD Test and Evaluation in PE 0602718BR.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601000BR / *DTRA BASIC RESEARCH*	Project (Number/Name) RU / *BASIC RESEARCH FOR COUNTERING WMD*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RU: *BASIC RESEARCH FOR COUNTERING WMD*	401.058	11.519	16.584	14.761	-	14.761	15.311	15.897	16.498	17.128	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Basic Research for Countering WMD project, as the nation's primary basic research portfolio dedicated to countering weapons of mass destruction (CWMD), is a core strategic investor in future scientific and technological progress across the Defense Threat Reduction Agency's (DTRA) mission areas. This project concentrates on high-risk, high-payoff basic research, leveraging world-class expertise in academia, government, and industry, to increase the foundational body of scientific knowledge supporting DTRA's Applied Research and Advanced Technology Development projects.

This project aligns with DTRA's strategic objectives that support policy and planning guidance from the Executive Office of the President, the DoD, and the broader WMD threat reduction community. The portfolio addresses this guidance through capability enhancements, projects, and Science and Technology (S&T) investments that support CWMD. Specifically, they include: accelerating the development of standoff radiological/nuclear detection capabilities; securing vulnerable materials; defeating WMD agents; strategic radiation hardened microelectronics; and leveraging science, technology, and innovation through domestic partnerships and agreements.

This project solicits, coordinates, and conducts research to build a robust, forward-looking fundamental research portfolio targeting strategic, mission-focused, basic research with high potential impact for CWMD. The research projects are selected for scientific merit, technical quality, and the potential for innovation. Each research project offers opportunities to expand the knowledge base to help the warfighter, to bring to bear new science solutions with a fresh approach, or to leverage revolutionary approaches to technical surprise, building a foundation for future CWMD solutions. This research will enable new capabilities to control, defeat, disable, and/or dispose of WMD threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Project RU: Basic Research for Countering WMD	11.519	11.584	14.761
Description: The Defense Threat Reduction Agency (DTRA) Basic Research Program conducts revolutionary countering-weapons of mass destruction (CWMD) scientific research with broad applicability across multiple mission areas. The research sets conditions for disruptive gains in the effectiveness of technology-enabled concepts of operation not possible through evolutionary excursions from the current state of practice. Basic research builds up U.S. research personnel, and institutional scientific capability and capacity to counter near peer competitors below the threshold of armed conflict.			
FY 2023 Plans: DTRA enters the third year of its URA program. The overarching goals of the two URAs remain unchanged.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601000BR / *DTRA BASIC RESEARCH*	**Project (Number/Name)** RU / *BASIC RESEARCH FOR COUNTERING WMD*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Collectively the URAs are training more than 177 students in STEM fields critical to DTRA's mission. Importantly the URAs are providing critical exposure to DTRA-mission relevant research via internships to 87 cadets and midshipmen from the U.S. Service Academies and ROTC programs. The DTRA Basic Research funded Materials Science in Extreme Environments (MSEE) URA, led by Johns Hopkins University, includes a team of 18 universities that work collaboratively with DTRA personnel to advance the fundamental understanding of material properties and mechanisms in non-equilibrium high pressure, high temperature, and high photon number regimes. The MSEE URA will enable new methods to disrupt WMD attacks, enhance conventional nuclear integration, and improve enhanced consequence analysis. - Complete first principles calculations and experiments that will improve DoD models of nuclear fireball dynamics across various environments. - Add new diagnostics (i.e., a flash x-ray spectrometer) to the experimental facility Hypervelocity Facility for Impact Research Experiments (HyFIRE). - Conduct experiments to improve DoD models of penetration into quartzite and sandstone for Hard and Deeply Buried Target defeat. - Test alliance designed and fabricated material targets at the OMEGA Laser Facility to investigate the effect of pulse length on thermomechanical shock propagation. - Investigate the effect of reduced laser power and tamper materials to support additional tampered OMEGA shot. - Develop composite nanoparticles with a staged energy release. - Create staged energy release composites and additive manufacturing-derived structure-function relationships. The Interaction of Ionizing Radiation with Matter (IIRM) URA, led by Pennsylvania State University, includes a team of 14 partner institutions that work collaboratively with DTRA personnel to advance the fundamental understanding of the interaction of radiation with materials for detection and electronics, devices and integration, nuclear survival and response, modeling, and simulation. Ultimately, this investment will enable radiation sensing from multiple platforms; cost effective hardening and hardness testing of DoD systems; and safe and efficient military operations in a nuclear environment. - Study novel findings on semiconductors for radiation detection that competes with the state of the art without the need for refrigeration or mechanical cooling to low temperatures, providing the potential for significant reduction to size, weight, and power, and ease of field use of current radiation detection capabilities. - Synthesize and test functional fibers with embedded microchip readouts that could be woven into uniforms for wearable radiation sensing.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601000BR / *DTRA BASIC RESEARCH*	**Project (Number/Name)** RU / *BASIC RESEARCH FOR COUNTERING WMD*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Conduct experiments at the Los Alamos Neutron Science Center for Systems on a Chip survivability in high neutron dose environments. - Determine appropriate gas concentrations to enable long range radiation detection, concentrate on experiments for laser based sensing methods to detect radiation plumes and contamination from long range. - Conduct additional testing on transconductance for alliance designed and fabricated Ferroelectric Field Effect Transistors (FeFETs); test for radiation effects to drive an improved device design for fabrication. - Verify and expand scintillation experiments with a focus toward potential integration with semiconductor materials for combined improvements in radiation detection. ***FY 2024 Plans:*** - Maintain two University Research Alliances (URA): Materials Science in Extreme Environments (MSEE): Develop and certify FY 2024-25 MSEE URA Biennial Program Plan and modify, adapt, and change 10 research thrust areas as required to meet new threats. Extend existing foundational research in three primary research areas supporting DTRA's mission in preparation for possible transition including: enhanced computational modeling for agent defeat scenarios, and quantification of uncertainty in nuclear blast simulation modeling. Interaction of Ionizing Radiation with Matter (IIRM): Develop and certify FY 2024-25 IIRM URA Biennial Program Plan and modify, adapt, and change 12 research thrust areas as required to meet new threats. Extend existing foundational research in three primary research areas supporting DTRA's mission in preparation for possible transition including: development and assessment of low-cost methods for assessing chip vulnerability, and implementation of AI-driven modeling techniques to develop novel semiconductor systems. - Provides four additional post-doctoral experts, two for each URA. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase from FY 2023 to FY 2024 is due to additional funding for post-doctoral expertise and expansion of basic research activities in the University Research Alliances (URAs). Additional resources fund enhancements for strategic competition to sustain global scientific enduring advantage in support of future warfighting. This will enable fundamental research in nuclear detonation plume modeling and radiological signature analysis to leverage novel Machine Learning techniques and automate discovery and manufacturing of new radiation-sensitive materials, reducing the cost of deployed radiation detectors by a factor of 10. This increase is funded predominately by decreased investment in Project RR: Countering WMD Test and Evaluation in PE 0602718BR.			
Accomplishments/Planned Programs Subtotals	11.519	11.584	14.761

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601000BR / *DTRA BASIC RESEARCH*	**Project (Number/Name)** RU / *BASIC RESEARCH FOR COUNTERING WMD*

	FY 2022	FY 2023
Congressional Add: Materials Science in Extreme Environments	-	5.000
FY 2023 Plans: Investment will enable the Materials Science in Extreme Environments (MSEE) program to more effectively support DoD's response to emerging threats by providing critical understanding, research transitions, and a highly skilled future workforce. Investment will: - Modernize aging facilities at four Lead Research Area Organization (LRAO) universities to ensure state of the art equipment and facilities are available to the URAs. - Further support of the collaborative workforce development program, Extreme Science Internships. - Support early career investigators and collaborative opportunities across the URAs for students, postdocs, and PIs.		
Congressional Adds Subtotals	-	5.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Procurement methods include competitive selection awards through university partnerships, DTRA’s Broad Agency Announcement, and collaborative funding through other organizations.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	915.573	191.050	191.632	208.870	-	208.870	212.096	206.741	202.757	206.871	Continuing	Continuing
RA: *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	382.969	45.294	32.140	37.218	-	37.218	37.914	29.639	30.543	31.213	Continuing	Continuing
RD: *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELEOPMENT*	229.184	97.766	106.095	119.670	-	119.670	120.980	122.543	119.240	121.625	Continuing	Continuing
RG: *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	155.280	31.145	30.277	30.871	-	30.871	31.589	32.220	31.788	32.423	Continuing	Continuing
RR: *CWMD TEST AND EVALUATION*	148.140	16.845	23.120	21.111	-	21.111	21.613	22.339	21.186	21.610	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Defense Threat Reduction Agency (DTRA) Counter Weapons of Mass Destruction (CWMD) Applied Research program element funds the application and advancement of basic scientific knowledge to develop novel materials, devices, systems, and methods supporting next generation concepts and technologies, to include advances in Weapons of Mass Destruction (WMD) surveillance, detection, defeat, prevention, nonproliferation, counter proliferation, consequence management, and treaty verification.

This Applied Research portfolio is aligned with strategic planning objectives and Science and Technology (S&T) investment direction established annually by DTRA, which directly support policy and planning guidance from the Executive Office of the President, the Department of Defense (DoD), and the broader WMD threat reduction community.

The portfolio advances DTRA's CWMD mission by balancing the following: invest in DTRA's applied research capabilities and increase the CWMD technology base to maximize future pay-off; capitalize on opportunities to deliver innovative, cost-effective solutions to technical challenges that must be resolved prior to system-specific technology investigations and development; and ensure applied research efforts are directly aligned to the mission-specific capability requirements of DTRA, the Military Departments, Combatant Commanders, other DoD and federal agencies, and international partners.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602718BR *I COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEAR CH*

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	197.011	192.162	205.414	-	205.414
Current President's Budget	191.050	191.632	208.870	-	208.870
Total Adjustments	-5.961	-0.530	3.456	-	3.456
• 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	-0.812	0.000			
• SBIR/STTR Transfer	-5.149	0.000			
• Realignments	-	0.000	3.456	-	3.456
• FFRDC	-	-0.530	-	-	-

Change Summary Explanation

The increase in FY 2024 from the previous President's Budget is due to the net impact of 1) increased investment in Project RD: Nuclear Technologies and Capabilities Development for nuclear survivability funded by decreased investment in Project RD in PE 0603160BR and 2) the realignment of resources from from Project RR: Countering WMD Test and Evaluation to Project RU: Basic Research for Countering WMD in PE 0601000BR.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	Project (Number/Name) RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RA: *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	382.969	45.294	32.140	37.218	-	37.218	37.914	29.639	30.543	31.213	Continuing	Continuing

A. Mission Description and Budget Item Justification

The CWMD Cross-Cutting Technical and Information Sciences project develops concepts and technologies in the areas of high-speed information processing, modeling and simulation, signal detection, and data-driven decision analysis in support of the Defense Threat Reduction Agency's (DTRA's) technical reach-back teams. This project develops and maintains continuously improving collaborative architectures and Weapons of Mass Destruction (WMD) modeling and simulation codes that drive an integrated suite of decision support tools serving the Combatant Commands, other Department of Defense (DoD) agencies, and national and international Countering WMD (CWMD) partners. This effort also funds research activities that benefit the public through analysis and engagement to reduce and counter threats posed by WMD via the Strategic Trends Research Initiative (STRI). STRI cultivates national and international research community partnerships across domains, bringing scientific, technical, and social science experts together to help understand and anticipate WMD capabilities and threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	45.294	32.140	37.218
Description: Project RA develops concepts and technologies in the areas of high-speed information processing, modeling and simulation, signal detection, and data-driven decision analysis. ***FY 2023 Plans:*** - Develop new and emergent advanced modeling and simulation tools, applications and other development activities to develop two, and deliver one new, integrated CWMD modeling capabilities to support in theater operational planning. - Develop analytics using machine and deep learning to provide geospatial prediction analysis and behavior variance for CWMD pattern-of-life analysis. - Develop processing algorithms using artificial intelligence and machine learning to tip and cue analysts for CWMD threat network analysis. - Provide strategic, urgent Counter-Threat capability development for urgent and emergent theater needs, with focus on detector and sensor design, data analysis and storage, search capabilities, defeat pathways, and continuous test site technical advancement. - Develop data integration, analysis and visualization solutions in support of CCMDs, Special Operations Forces, and other mission partners. Incorporate new technologies to increase the scalability, reusability, and transferability of data science capabilities developed across commands/units supported.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Apply advanced analytics to develop novel capabilities for illuminating and disrupting procurement and proliferation networks and coordinating CWMD operations. Will transition at least two operational prototypes to supported commands/units or advanced developers. - Conduct studies to understand and explore the Chemical, Biological, Radiological, and Nuclear spectrum and enabling technology challenges facing our warfighters in the next five to ten years. ***FY 2024 Plans:*** - Use new and emergent advanced modeling and simulation tools and development activities to develop and deliver one new, integrated CWMD modeling capability to support in theater operational planning. - Expand development capabilities within SecDevOps pipeline and move to a more automated, secure, agile, and efficient System Development Life Cycle (SDLC); combine containerized technology environments enabling customer to package application development of all of its dependencies and process together with DoD approved Cloud solution to create hybrid, on premise/ Cloud solutions to meet DTRA mission needs and DoD software development mandates; increase the security posture of the DTRA Experimentation Lab-Unclassified (DEL-U) enclave by meeting DISA Risk Management Framework and Continuous Monitoring measurements to ensure DTRA maintains Authority To Operate (ATO); implement automated security and monitoring measures in DEL-Classified enclave to meet Agency requirements for the Annual Security Review (ASR) and upcoming ATO (FY2024/25). - Provide ready access to the DoD High Performance Computing Modernization Program (HPCMP) resources enabling researchers across the entire RD application spectrum to rapidly perform the detailed computer simulations integral to the successful execution of the Agency's R&D Mission; enable performance engineers and DTRA application teams to collaborate, modernize, and optimize the heavily used High Fidelity (HF) computer codes for existing and future HPC architectures. - Facilitate international S&T cooperation with partners from 14+ countries, contributing to new U.S. CWMD capabilities, improved ally CWMD capability, and RDT&E cost sharing; conduct technology demonstration events for multiple CCMDs, helping to match developmental CWMD capabilities with critical warfighter needs. - Sponsor projects with DoD academic organizations, FFRDCs, and U.S. think-tanks to gather insights on CMWD challenges for the Warfighter and refine strategic dialogues/symposia/fora to accommodate year-upon-year learning and advancement on anticipated future battlespace challenges. - Generate timely and actionable recommendations on countering and mitigating current and future WMD trends and challenges. - Conduct timely and relevant strategic studies and dialogues with international partners to facilitate year-upon-year learning on anticipated future challenges. - Refine strategic research projects to improve tangible outcomes and actionable recommendations for future activities to deter and counter WMD threats.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Provide in-depth research and analysis to anticipate, assess, and address key challenges related to strategic stability, strategic competition, multipolar escalation dynamics, limited WMD development and use, and other WMD threat trends by leveraging expert community resources. - Sponsor external research on strategic WMD and emerging threat topics and execution of bilateral, trilateral, and multilateral strategic dialogues with allies/partners. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase from FY 2023 to FY 2024 funds 1) high performance computing code modernization; 2) advanced modeling and simulation tools to develop and deliver a new integrated CWMD modeling capability in support in theater operational planning; 3) increased capacity to leverage and evaluate department capabilities to develop innovative and agile new technologies to counter the full spectrum of weapons of mass destruction; and 4) Quick Reaction Capability requirements and additional information technology engineering efforts directly in support of the Agency's CWMD mission.			
Accomplishments/Planned Programs Subtotals	45.294	32.140	37.218

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 33/0603160BR/RA: *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	76.268	78.991	86.415	-	86.415	90.571	88.687	89.660	92.136	Continuing	Continuing
• 105/0604551BR/RA: *CATAPULT INFORMATION SYSTEM*	6.979	7.130	8.328	-	8.328	7.475	7.625	7.777	7.933	Continuing	Continuing
• 144/0605502BR/ RA: *SMALL BUSINESS INNOVATION RESEARCH*	16.870	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	Project (Number/Name) RD / *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELEOPMENT*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RD: *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELEOPMENT*	229.184	97.766	106.095	119.670	-	119.670	120.980	122.543	119.240	121.625	Continuing	Continuing

A. Mission Description and Budget Item Justification

Nuclear Technologies and Capabilities Development encompasses the following related areas:

Research, development, test, and evaluation (RDT&E) to identify, develop, and exploit signatures associated with nuclear threats in support of U.S. capabilities that detect and interdict such threats; and locate, identify, and track special nuclear material and improve detection factors such as range, time, sensitivity, and accuracy to enhance Service and Special Mission Unit capabilities. These efforts support Department of Defense (DoD) requirements for countering terrorism, counterproliferation, nonproliferation, countering rogue states, and homeland defense.

RDT&E to systematically study signatures associated with adversary nuclear programs and nuclear detonations to gain knowledge or understanding necessary to: determine technical capabilities needed to improve DoD contingency planning activities; improve DoD situational awareness on the nuclear battlefield; and improve capabilities to attribute the source of a nuclear detonation.

Research and develop innovative technologies for the protection of mission-essential personnel, critical military and national defense capabilities, and associated control and support systems during a nuclear event. Research under this project supports the mission critical systems identified under DoD Instruction 3150.09, Chemical, Biological, Radiological, and Nuclear Survivability Policy. System vulnerability research develops nuclear assessment capabilities to support operational planning, weapons effects predictions, and strategic system design. This activity also provides the DoD's nuclear design and protection standards for new and existing systems, e.g., command and control facilities and aircraft. Key systems include the Nuclear Command and Control System, the net-centric thin-line, and both military and civilian satellites and associated support systems. Experimental capabilities research provides the warfighter with unique x-ray, gamma ray, and electromagnetic pulse (EMP) test capabilities in support of system survivability development, certification, and sustainment. These efforts also support international collaboration, user groups, case study reviews, and the Joint Atomic Information Exchange Group. The human survivability effort conducts research to develop and validate mortality and morbidity models associated with radiological and nuclear weapon effects.

Research and develop modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions; consolidate validated modeling tools for integrated functionality; predict system responses to nuclear and radiological weapons producing electromagnetic, thermal, blast, shock, and radiation environments; provide detailed adversary nuclear infrastructure characterization to enhance counterforce operations and hazard effects; and, develop foreign nuclear weapon outputs.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RD / *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELEOPMENT*

Delivers integrated applications, data analysis, and cloud-ready AI-enhanced capabilities, cross-cutting platform supporting full spectrum of nuclear operations, wargaming, and assessments. Provides timely electronic access to Nuclear Testing Archives supporting validation of the effectiveness of the Nuclear Deterrent and survivability of U.S. military assets without a return to nuclear testing.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RD: Nuclear Technologies and Capabilities Development	97.766	106.095	119.670
Description: Project RD develops direct and indirect technologies for the detection of radiation and non- radiative signatures associated with nuclear threats, and advances warfighter capabilities to rapidly locate, characterize, and counter such threats. ***FY 2023 Plans:*** - Conduct technical demonstration of radiological-nuclear (RN) Virtual Reality/Augmented Reality (VR/AR) capabilities. - Investigate autonomous operations and swarming applications for radiation sensors on unmanned platforms. - Mature advanced search and discovery (ASD) of archived nuclear documents using AI/ML algorithms to support increased user portal retrieval capability of information from documents (25%), photographs (10%), and films (2%) to enable nuclear survivability and effects algorithm programs with higher fidelity data. - Enhance Nuclear, Chemical, Biological, Radiological, High Explosives (NCBRE) Artificial Intelligence/Machine Learning Environment (NAIMLE) data curation and operability specific to RN data types; integration of container development between working data models related to nuclear missions - Integrate 3D effects model supporting aviation assets in theater nuclear planning tool to improve nuclear planning capability for U.S. Army and CCMDs. - Deliver tools for visualization of data feeds to meet warfighter needs and for sharing data with foreign partners (Supporting Nuclear Enterprise Threat Characterization and Nuclear Enterprise Threat Isolation). - Facilitate three nuclear war-games design and operation with Mission Impacts of Nuclear Events (MINES); Support five DoD nuclear war-games and exercises design and operation with SME, existing tools, and MINES capabilities; Sponsor/host two nuclear war-games with updated MINES capabilities. - Initiate x-ray development to optimize key performance parameters on new Quad Eagle Simulator; enable growth and continued availability of DTRA's capabilities. - Develop EMP Planning Tools (Electromagnetic Reliability & Effects Prediction (EMREP) v9, STRATCOM Support equipment, Nuclear Battlefield Test Support). - Conduct EMP modular expansion and data demonstration, scintillation Hardware-in-the-Loop (HWIL) production/certification demonstrations, modeling and experimentation to characterize dose rate, and neutron effects. ***FY 2024 Plans:*** - Prototype search capabilities to increase document recognition by ~167%, photography by ~150%, and film by 400%, over the FY 2023 baseline metrics, enabling greater accessibility for nuclear technologies SMEs.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RD / *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELEOPMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Integrate a computational methodology to estimate vehicle-specific radiation protection factors to assess personnel survivability. - Use the Mission Impacts of Nuclear Events (MINES) software to support design/execution of nuclear play in 10 DoD exercises (including 2 Title X), 1 NATO or UK war-game/exercise, and 1 nuclear war-game for CCMDs. - Complete analysis of high-explosive experiment at Balapan nuclear testing site; deliver advanced models of yield estimation in extreme topography. - Develop electronics to replace Geiger tubes for high-dose rate applications to reduce the size, weight, power, and increase the actionable information available to end-users during Conventional Nuclear Integration (CNI) warfighting. - Transition improved electronics from applied research to prototyping and evaluate emerging National Nuclear Security Administration (NNSA) developed scintillators to reduce the size, weight, power, and cost, while increasing the performance of radiation detection systems; evaluate non-radiation approaches to detecting and geo-locating nuclear weapons or delivery systems. - Develop near-field technologies to improve real-time assessments of the geo-location, height-of-burst, and other characterization data from a nuclear explosion during battlefield operations. - Deliver improved multi-physics / multi-regime algorithms to bridge modeling gaps in time and burst altitude, and add additional EMP models to contribute to Nuclear Command, Control and Communications (NC3) modernization efforts, USAF Ground Based Strategic Deterrent, and USN Strategic Systems Programs (SSP) modernization. - Deliver updated economic, social, communications, and electrical power impact models for significant nuclear weapons environments. - Deliver improved nuclear weapons environment model that reduces uncertainty of fratricide on military systems. - Deliver improved thermal radiation environment model valid across a broader range of weapon employment scenarios, geographies, and atmospheric conditions. - Deliver air blast models jointly with the UK appropriate for non-ideal environments. - Deliver improved nuclear weapons environment model for nuclear fire ignition and spread in urban areas accounting for building types, with initial atmospheric conditions from DoD-approved numerical weather model forecasts. - Nuclear Survivability (NS) Military Standards (MIL-STDs) and Military Handbooks (MIL-HDBKs) for Space and Missiles (NTSI): Final coordination of Nuclear Space Environments MIL-STD, Phase 1 of the Comprehensive Endo-Exo Nuclear Survivability (CANES) Environment MIL-STD revision. - Support Nuclear Weapons Effects survivability testing at the National Ignition Facility; execute experiments for complex surfaces and optimization of sources; and support 41 weeks of strategic user testing at the West Coast Facility. - Transition scintillation hardware-in-the-loop from prototype to user test capability, demonstrate modular electromagnetic pulse capability on warfighter asset and begin transition from prototype to user test capability, and research on characterization and mitigation of prompt neutron and gamma dose rate effects.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RD / *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELEOPMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Deliver version 6.0 of Testable Hardware Toolkit and support over 40+ customers with training and requests; conduct response validation test campaign, and conduct large solar cell experiment on Quad Eagle. - Demonstrate the full operating capability of Quad Eagle X-ray Simulator to the Test and Evaluation (T&E) community and conduct a Critical Design Review of Pithon II data sources to modernize diagnostics for use in future test events. - Publish Ground Systems Hardening MIL-STD and MIL-HDBK-4023 (Surface Vessel EMP Hardening). ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase from FY 2023 to FY 2024 is due to 1) increased investment in nuclear survivability for nuclear weapons effects modeling and simulation (M&S), targeting, and consequence-of-execution in response to increased demand and 2) increased investment in nuclear wargaming support and assessments with a renewed emphasis on Great Power Competition.			
Accomplishments/Planned Programs Subtotals	97.766	106.095	119.670

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 33/0603160BR/RD: *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	53.969	60.249	51.697	-	51.697	52.341	54.236	53.596	54.667	Continuing	Continuing
• 134/0605000BR/RD: *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	13.695	14.403	14.414	-	14.414	14.341	14.569	16.922	17.260	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	Project (Number/Name) RG / *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RG: *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	155.280	31.145	30.277	30.871	-	30.871	31.589	32.220	31.788	32.423	Continuing	Continuing

A. Mission Description and Budget Item Justification

Counter WMD Technologies and Capabilities Development encompasses the following areas:

Defeat Technologies supports Combatant Commands through research, development, and transition of offensive weapons and other capabilities to combat WMD while mitigating collateral contamination effects. Technology development focuses on the physical or functional defeat of WMD threat materials, an adversary's ability to deliver the same, and the physical and nonphysical support networks enabling both. It does so through the systematic identification and maturation of technologies capable of defeating WMD agents or agent-based processes and selecting technologies for integration into weapons, delivery systems, or rapid WMD elimination capabilities. This effort includes developing specific WMD agent/agent-based process simulants, sub-scale test infrastructure, and sampling capability required for effective development, testing, and evaluation of next-generation CWMD capabilities. The project places a high priority on understanding, characterizing, and validating potential weapon effects within mathematical confidence as it relates to the unintended release of hazardous threat materials. Energetics research develops materials and weapon design technology providing defeat capabilities for engaging hard and deeply buried targets that are beyond current high explosive blast/fragmentation warhead technology. Technologies with the potential for weapon and capability integration are transitioned to Budget Activity (BA) 3, Advanced Technology Development (ATD) efforts. On a limited basis, technology test data is shared with coalition partners.

WMD counterforce technologies research develops weapons effects modeling algorithms, full and sub-scale test series required to investigate CWMD weapon effects and sensor performance, and visualization and situational awareness tools to support the next generation Technical Reachback cell. These activities are critical enablers for the development of advanced CWMD planning tools. This effort couples long-range fundamental and applied research with technology development in the physical, life, and computational sciences to support kill chain activities in combating emerging WMD threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RG: Counter WMD Technologies and Capabilities Development	31.145	30.277	30.871
Description: Project RG uses applied research to develop counter WMD technologies and capabilities. ***FY 2023 Plans:*** - Develop, test, and evaluate specialized capabilities to protect against and defeat WMD though diagnostics and characterization of Agent Defeat Modeling and Simulation Baseline (ADMB). - Conduct lab-scale tests and large/full-scale test event to validate source term prediction capabilities for ADMB. - Conduct small and mid-scale tests to verify weapons effects phenomenology (WEP) models (e.g. over-burial and penetration).			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RG / *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Begin to explore a Cloud Based Solution transition and continue multi-dimensional upgrades into the Vulnerability Assessment and Protection Option (VAPO) Platform. - Complete partnership with U. S. Army Engineer Research and Development Center (ERDC) and the United Kingdom (UK) to deliver a VAPO capability allowing end users to perform an assessment of aerial delivered threats and weapons. - Initiate combined effects model development with completion of Hi-Fi calculations. - Explore existing Artificial Intelligence/Machine Learning (AI/ML) advancements for weapons effects phenomenology RDT&E application. - Program, plan, and manage Explosive Ordnance Disposal (EOD) diagnostics and defeat projects and deliver technologies. - Program, plan, and manage low-visibility and breaching projects and deliver technologies. - Provide Systems Engineering and Integration support for internal DTRA programs and provide subject matter expertise to external organizations with efforts related to CWMD and hard and deeply buried target (HDBT) defeat. - Deliver Targeting Recommendation Packages and conduct training activities as requested by the CCMDs. - Support weapons effects testing programs and weapons development activities in support of Combatant Command CWMD requirements. ***FY 2024 Plans:*** - Complete validation and accreditation of ADMB for agent defeat and release models to improve collateral effects prediction for CWMD targeting. - Integrate patterns of life algorithms programs that provide support to USSOCOM analysts in the field with automated tools. - Deliver text analytics capabilities to develop knowledge graphs which provide indications and warning of WMD information, products, or technologies that could be directly misapplied to pose a significant chemical/biological WMD threat. - Conduct studies to fundamentally support Next Generation Agent Defeat capabilities in support of strategic weapons capabilities to hold WMD targets at risk while minimizing collateral effects. - Complete rapid prototyping and rapid fielding of CWMD Applique Kit (V2) for U.S. Army Small Multi-Purpose Equipment Transport (SMET) in support of United States Army Special Operations Command Request for Support. - Develop first generation WMD defeat and internal dispersion neural network models to provide delivery of optimized attack planning leveraging neural networks focusing on strategic near-peer targets. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase from FY 2023 to FY 2024 is due to inflation.			
Accomplishments/Planned Programs Subtotals	31.145	30.277	30.871

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RG / *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 33/0603160BR/RG: *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	265.085	257.951	254.610	-	254.610	260.476	264.328	260.045	265.246	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	Project (Number/Name) RR / *CWMD TEST AND EVALUATION*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RR: *CWMD TEST AND EVALUATION*	148.140	16.845	23.120	21.111	-	21.111	21.613	22.339	21.186	21.610	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Countering WMD Test and Evaluation project provides a unique national test capability for simulated WMD facilities and processes. This capability provides structured and systematic end-to-end test event planning, preparation, management, execution, and data analysis. It also offers test instrumentation (data acquisition systems and optics), scientific analysis and predictions, test article construction, test article/test bed remediation, tunnel mining, architectural and engineering design, systems engineering and integration, and test data management. The project leverages 50 years of expertise in investigating weapons effects and target response across the spectrum of hostile environments that could be created by proliferate nations or terrorist organizations with access to advanced conventional weapons or WMD. Subject matter experts design full and sub-scale testing strategies focusing on weapon-target interaction with fixed soft and hardened facilities to include above ground facilities, cut-and-cover facilities, and deep underground tunnels.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RR: Countering WMD Test and Evaluation	16.845	23.120	21.111
Description: Project RR provides a unique national test bed capability for the study of weapon-target interaction, simulated WMD facility characterization and defeat testing, and evaluation of asymmetric threats observed in theater to evaluate the implications of WMD and other special weapon use against U.S. military and civilian assets. Additionally, Project RR develops instrumentation and identifies unique threat signatures that can support early detection and development of countermeasures to support Combatant Command needs.			
FY 2023 Plans: - Modernize and evolve instrumentation and diagnostics capability to support test and evaluation activities across the CWMD spectrum, and develop new methods to address the evolving threats. - Remediate and restore existing test bed articles to continue support across the CWMD spectrum. - Replicate, test, and evaluate identified threat WMD systems and use tactics, techniques, and procedures to support the development of WMD detection, characterization, and countermeasures documented in CCMD requirements. - Perform threat-relevant test and evaluation activities to document unique signatures that identify, characterize, and determine the effectiveness of defeat techniques for WMD proliferation and production facilities, leveraging the Nevada National Security Site, and a novel transportable capability that can replicate specific threats of interest to the CCMDs. - Design and build testbeds in small, mid, and large-scale environments capable of capturing data needed to improve and validate high-fidelity modeling and simulation tools used to predict U.S. weapon and adversary threat effects on facilities of interest.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RR / *CWMD TEST AND EVALUATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Maintain ability to execute RDT&E testing at Kirtland AFB, the White Sands Missile Range (WSMR), and the Nevada National Security Site. ***FY 2024 Plans:*** - Modernize and evolve instrumentation and diagnostics capability to support test and evaluation activities across the CWMD spectrum, and develop new methods to address the evolving threats. Includes improving data communications links, enhancing acoustic temperature systems, and networking autonomous underground vehicles (UGVs) with obstacle avoidance capabilities. - Remediate and restore existing test bed articles to continue support across the CWMD spectrum. Includes structure demolition and clean-up at WSMR, NM. - Replicate, test, and evaluate identified threat WMD systems and use tactics, techniques, and procedures to support the development of WMD detection, characterization, and countermeasures documented in CCMD requirements. - Perform threat-relevant test and evaluation activities to document unique signatures that identify, characterize, and determine the effectiveness of defeat techniques for WMD proliferation and production facilities, leveraging the Nevada National Security Site, and a novel transportable capability that can replicate specific threats of interest to the CCMDs. - Design and build testbeds in small, mid, and large-scale environments capable of capturing data needed to improve and validate high-fidelity modeling and simulation tools used to predict U.S. weapon and adversary threat effects on facilities of interest. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease from FY 2023 to FY 2024 is due to decreased investment in some test articles and infrastructure upgrades to fund the expansion of post-doctoral expertise and basic research activities in the University Research Alliances (URAs) in PE 0601000BR.			
Accomplishments/Planned Programs Subtotals	16.845	23.120	21.111

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 33/0603160BR/RR: *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	4.639	9.530	8.225	-	8.225	7.908	7.928	6.016	6.136	Continuing	Continuing
• 34/0603176BR/RR: *ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT*	0.000	6.505	7.990	-	7.990	7.962	7.934	7.102	7.244	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	**Project (Number/Name)** RR / *CWMD TEST AND EVALUATION*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603160BR *I COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	1,027.974	399.961	406.721	400.947	-	400.947	411.296	415.179	409.317	418.185	Continuing	Continuing
RA: *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	199.216	76.268	78.991	86.415	-	86.415	90.571	88.687	89.660	92.136	Continuing	Continuing
RD: *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	195.133	53.969	60.249	51.697	-	51.697	52.341	54.236	53.596	54.667	Continuing	Continuing
RG: *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	633.455	265.085	257.951	254.610	-	254.610	260.476	264.328	260.045	265.246	Continuing	Continuing
RR: *CWMD TEST AND EVALUATION*	0.170	4.639	9.530	8.225	-	8.225	7.908	7.928	6.016	6.136	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Advanced Technology Development portfolio is aligned with National and DoD strategic objectives and with Science and Technology (S&T) investment direction established annually by the Defense Threat Reduction Agency (DTRA). The objectives directly support policy and planning guidance from the Executive Office of the President, the Department of Defense (DoD), and the broader Weapons of Mass Destruction (WMD) threat reduction community.

The portfolio advances the Countering WMD (CWMD) mission by selecting advanced technology development initiatives that meet the following criteria: (1) efforts are clearly defined and directly linked to mission-specific capability requirements of DTRA, the Military Departments, Combatant Commanders, other DoD and federal agencies, and international partners; (2) preliminary assessments of subsystems and components offer the highest potential for technological feasibility, operability, and producibility upon transition out of S&T research; (3) activities demonstrate cost effectiveness or cost reduction potential of technologies during field testing or simulation at scale.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603160BR *I COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	409.862	395.721	407.669	-	407.669
Current President's Budget	399.961	406.721	400.947	-	400.947
Total Adjustments	-9.901	11.000	-6.722	-	-6.722
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	11.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.812	0.000			
• SBIR/STTR Transfer	-10.713	0.000			
• Realignments	-	-	-6.722	-	-6.722

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: RD: *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*		
Congressional Add: *Data-Driven Methods of Nuclear Weapon Discovery*	4.000	0.000
Congressional Add Subtotals for Project: RD	4.000	0.000
Project: RG: *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*		
Congressional Add: *Detection and Tracking Technology*	4.000	6.000
Congressional Add: *Reduced Order Models*	2.500	0.000
Congressional Add: *Advanced Manufacturing of Energetics*	0.000	5.000
Congressional Add Subtotals for Project: RG	6.500	11.000
Congressional Add Totals for all Projects	10.500	11.000

Change Summary Explanation

The decrease in FY 2024 from the previous President's Budget is due to decreased investment in Projects RA: CWMD Cross-Cutting Technical and Information Sciences, RD: Nuclear Technologies and Capabilities Development, and RR: CWMD Test and Evaluation to fund increased investment in 1) Project RR: CWMD Test and Evaluation in PE 0603176BR, 2) Project RD: Nuclear Technologies and Capabilities Development in PEs 0602718BR and 0605000BR, and 3) Project RA: CWMD Cross-Cutting Technical and Information Sciences in PE 0604551BR.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	Project (Number/Name) RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RA: *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	199.216	76.268	78.991	86.415	-	86.415	90.571	88.687	89.660	92.136	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The CWMD Cross-Cutting Technical and Information Sciences project provides technical expertise through continuous reach-back and quick reaction support to the United States and its allies across the Countering Weapons of Mass Destruction (CWMD) mission space. The project performs continuous modeling of ad hoc computational analyses on the consequences of Weapons of Mass Destruction (WMD) in consultation with military and civilian planners, warfighters, and first responders. The project also supports international CWMD cooperation by developing technologies and concepts suitable for foreign release.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	76.268	78.991	86.415
Description: Project RA develops modeling and simulation capabilities and provides technical reachback support to maintain and increase decision advantages for the United States and its allies through improved situational understanding across the complete CWMD mission space. ***FY 2023 Plans:*** - Develop tools to improve CWMD situational awareness capabilities integration into Android/web based environments supporting the warfighter. - Provide 24/7 technical reachback assistance, decision support and planning support to CCMD, Service, interagency and other government customers to support immediate mission and operational environments. - Provide critical training support in CWMD-relevant models to over 500 strategic partner community students. - Anticipate responding to over 1250 requests for information/assistance with over 95% timeliness in responses. - Facilitate technical exchanges with partners in at least 14 countries, and with all geographic and functional CCMDs, to improve understanding of and refine requirements. Will conduct at least one CCMD technology demonstration event to showcase and deliver capability solutions to theater customers to meet critical CWMD requirements. - Leverage applied research from within the broader portfolio to develop prototypes for fielding and testing, then will transition them to partner organizations with unique strategic customers to meet requirements aligned with the current National Defense Strategy. ***FY 2024 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Provide 24/7 technical reachback assistance, decision support and planning support to CCMD, Service, interagency and other government customers to support immediate mission and operational environments; respond to over 1200 requests for information/assistance with over 95% timeliness in responses. - Develop data integration, analysis and visualization solutions in support of CCMDs, Special Operations Forces, and other mission partners; apply advanced analytics to develop novel capabilities for illuminating and disrupting procurement and proliferation networks and coordinating CWMD operations; transition operational prototype applications/processes to supported commands/units or sustainment programs. - Develop and deliver critical technical capabilities responsive to urgent, emergent theater requirements in support of critical strategic partners via non-traditional, efficient acquisition pathways; deliver timely technical capabilities in response to emergent needs that would otherwise not be met in the required timeline. - Enhance and integrate toolset for capturing, documenting, decomposing, and prioritizing DTRA RDT&E activities, including the identification and de-confliction of redundancies across DTRA, greater DoD and broader government CWMD capability development activities. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase from FY 2023 to FY 2024 funds quick reaction capabilities in response to emergent threats posed by highly competitive security environments characterized by diverse and dynamic weapons of mass destruction (WMD) risks across multiple domains. While the threat posed by Russia is acute, China – through rapid strategic military expansion, pursuit of advanced technical capabilities, and an aggressive regional posture – is the pacing challenge. DTRA's R&D efforts under this program will leverage cross-departmental capabilities to develop innovative and agile new technologies to counter the full spectrum of emergent WMD threats identified by combatant commands and services.			
Accomplishments/Planned Programs Subtotals	76.268	78.991	86.415

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 23/0602718BR/RA: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	45.294	32.140	37.218	-	37.218	37.914	29.639	30.543	31.213	Continuing	Continuing
• 105/0604551BR/RA: *CATAPULT INFORMATION SYSTEM*	6.979	7.130	8.328	-	8.328	7.475	7.625	7.777	7.933	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 144/0605502BR/ RA: *SMALL BUSINESS INNOVATION RESEARCH*	16.870	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	16.870	16.870

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	Project (Number/Name) RD / *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RD: *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	195.133	53.969	60.249	51.697	-	51.697	52.341	54.236	53.596	54.667	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Research, development, test, and evaluation (RDT&E) to identify, develop, and exploit signatures associated with nuclear threats in support of U.S. capabilities that detect and interdict such threats; and locate, identify, and track special nuclear material and improve detection factors such as range, time, sensitivity, and accuracy to enhance Service and Special Mission Unit capabilities. These efforts support Department of Defense (DoD) requirements for countering terrorism, counter proliferation, nonproliferation, countering rogue states, and homeland defense.

RDT&E to systematically study signatures associated with adversary nuclear programs and nuclear detonations to gain knowledge or understanding necessary to: determine technical capabilities needed to improve DoD contingency planning activities; improve DoD situational awareness on the nuclear battlefield; and improve capabilities to attribute the source of a nuclear detonation.

Research and develop innovative technologies for the protection of mission-essential personnel, critical military and national defense capabilities, and associated control and support systems during a nuclear event. Research under this project supports the mission critical systems identified under DoD Instruction 3150.09, Chemical, Biological, Radiological, and Nuclear Survivability Policy. System vulnerability research develops nuclear assessment capabilities to support operational planning, weapons effects predictions, and strategic system design. This activity also provides the DoD's nuclear design and protection standards for new and existing systems, e.g., command and control facilities and aircraft. Key systems include the Nuclear Command and Control System, the net-centric thin-line, and both military and civilian satellites and associated support systems. Experimental capabilities research provides the warfighter with unique x-ray, gamma ray, and electromagnetic pulse (EMP) test capabilities in support of system survivability development, certification, and sustainment. These efforts also support international collaboration, user groups, case study reviews, and the Joint Atomic Information Exchange Group. The human survivability effort conducts research to develop and validate mortality and morbidity models associated with radiological and nuclear weapon effects.

Research and development modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions; consolidate validated modeling tools for integrated functionality; predict system responses to nuclear and radiological weapons producing electromagnetic, thermal, blast, shock, and radiation environments; provide detailed adversary nuclear infrastructure characterization to enhance counterforce operations and hazard effects; and, develop foreign nuclear weapon outputs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RD: Nuclear Technologies and Capabilities Development	49.969	60.249	51.697

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	**Project (Number/Name)** RD / *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Description: Project RD develops, integrates and transitions radiation detection technologies, and systems, tools, techniques, and procedures that take advantage of non-radiation based signatures, in order to advance warfighter capabilities to rapidly detect, localize, characterize, and interdict nuclear and radiological threats. ***FY 2023 Plans:*** - Provide USSTRATCOM with Nuclear Capability Services (NuCS) integration of five improved Enhanced Consequence Analysis (ECA) models. - Deliver improved nuclear weapons environment model that accounts for nuclear fire ignition in thick fuels. - Conduct test at the Large Blast Thermal Simulator (LBTS) to quantify combined air blast and thermal effects. - Deliver improved nuclear weapons environment models that reduces uncertainty from nuclear ground shock. - Deliver ECA logistics and petroleum transmission models that account for impacts of significant nuclear weapons environments. - Begin standard development for Military Standard (MIL-STD) for DoD Battlefield Systems. - Publish updated nuclear survivability standards for Military Handbook (MIL-HDBK), Surface Vessels. - Develop nuclear survivability (NS) standards for MIL-STDs and MIL-HDBK for Space and Missiles; prepare final coordination of MIL-STD 3053; conduct initial MIL-STD 3054 revision coordination. - Conduct EMP Technology and Vulnerability Assessments for VC-25B, Ground-Based Strategic Deterrent (GBSD - Minuteman replacement), and FFG-62 support. - Demonstrate platform agnostic sensors networked within military command systems; integrate edge data processing for radiological-nuclear (RN) assessments across all echelons; provide prototype 3D mapping capability for the Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV). ***FY 2024 Plans:*** - Develop AI/ML capability to ingest and analyze sensor feeds into DoD C2 systems for situational awareness, risk mitigation planning, and assessment tools. - Deliver Mission Impacts of Nuclear Events (MINES) support of the analysis and assessment of CCMD OPLANs, COA development, and CONOPs; leverage Artificial Intelligence/Machine Learning (AI/ML) and Augmented Reality/Virtual Reality (AR/VR) to increase nuclear environment visualization. - Complete laboratory testing of next-generation radionuclide particulate monitoring system and prototype field mass-spectrometry analysis system; operational test and evaluation (OT&E) of field X-ray/gamma analysis system. - Transition modular radiation detection systems to meet the needs of Explosive Ordinance Disposal, Special Operations Forces, National Guard Bureau, 20th CBRNE, and DTRA Technical Support Groups (TSGs), while ensuring every system is interoperable with the widely used Tactical Assault Kit (TAK) ecosystem.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	**Project (Number/Name)** RD / *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Support end-user early operational assessments and transition activities to ensure prototype capabilities meet the minimum criteria to be inserted into a program-of-record or for direct procurement. - Transition the Dose Rate Application to DTRA/TSG and Service end-users, complete transition of VIPER to Army Multi-Purpose Vehicle (AMPV), and begin transitioning VIPER into CH-47 Chinook, UH-60 Black Hawk, and UH-72 Lakota airborne platforms to include airworthiness certifications. - Perform environmental testing on the Vehicle Mounted Radiation Detection System (VMRDS) and fix any weaknesses in the system in preparation for transition to National Guard Civil Support Teams. - Collaborate with the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense's CBRN Sensory Integration on Robotic Platforms for the Chemical Biological Incident Response Force (CBIRF) program to integrate state-of-the-art radiation detection systems on the Nuclear, Biological, Chemical Reconnaissance Vehicle (NBCRV) Skyraider Unmanned Aerial System (UAS). - Demonstrate nuclear weapon effects capabilities in a relevant cloud environment for evaluation by Enhanced Consequence Analysis (ECA), MINES, and the Nuclear, Chemical, Biological, Radiological, and high Explosive (NCBRE) Analysis Toolset (NATs) and continue development and verification and validation (V&V) of capabilities as prioritized by end users. - Demonstrate waste water and agricultural models that account for impacts of significant nuclear weapons environments. - Deliver updated nuclear effects damage calculator for Army maneuver planning. - Improve operational USSTRATCOM nuclear planning tools. - Publish two updated nuclear weapons effects chapters. - Expand the historical nuclear testing archive at Defense Threat Reduction Information Analysis Center (DTRIAC). ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease from FY 2023 to FY 2024 is due to the net impact of decreased investment in radiation detection and nuclear test personnel review and increased investment in nuclear wargaming with renewed emphasis on Great Power Competition and nuclear and radiological effects in this program element.			
Accomplishments/Planned Programs Subtotals	49.969	60.249	51.697

	FY 2022	FY 2023
Congressional Add: Data-Driven Methods of Nuclear Weapon Discovery	4.000	0.000
FY 2022 Accomplishments: - Developed tool to derive nuclear weapons-to-critical-infrastructure coupling parameters from data-driven sources to improve operational planning for conventional and nuclear battlefield activities.		

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TEC HNOLOGY DEVELOPMENT*	**Project (Number/Name)** RD / *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*

	FY 2022	FY 2023
- Developed and verified new models that simulate the impacts of high-altitude nuclear detonations on networked infrastructures to be run on classified DoD networks for operational planners. ***FY 2023 Plans:*** N/A		
Congressional Adds Subtotals	4.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 23/0602718BR/RD: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	97.766	106.095	119.670	-	119.670	120.980	122.543	119.240	121.625	Continuing	Continuing
• 134/0605000BR/RD: *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	13.695	14.403	14.414	-	14.414	14.341	14.569	16.922	17.260	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TEC HNOLOGY DEVELOPMENT*	Project (Number/Name) RG / *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RG: *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	633.455	265.085	257.951	254.610	-	254.610	260.476	264.328	260.045	265.246	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Counter WMD Technologies and Capabilities Development project develops advanced technologies and weapon concepts and validates their applicability to CWMD. Research encompasses the following areas:

Defeat Technologies supports Combatant Commands through research, development, and transition of offensive weapons and other capabilities to combat WMD while mitigating collateral contamination effects.

Enable rapid capability delivery supports urgent warfighter operational requirements in countering WMD and emerging threats, often below the level of armed conflict. This research develops and delivers urgent CWMD capabilities to provide Combatant Commands a competitive advantage against WMD-capable adversaries with a focus on innovative, agile, achievable, and effective technology solutions for DoD sensitive and classified programs, Combatant Command hybrid warfare support, and competition below the level of armed conflict.

Counter emergent threat technologies research develops and transitions a full spectrum of new technologies to counter emergent WMD threats providing combatant commanders improved offensive capabilities in support of near-peer emerging threats and counter-proliferation missions that combat weapons of mass destruction. This research supports the U.S. Special Operations Command (USSOCOM) in two areas: (1) counter proliferation research is a collaborative effort to develop advanced, warfighter-unique technologies to defeat WMD development and acquisition pathways, to include defeat of the devices themselves, while minimizing risks to U.S. forces; and (2) counter emerging threats concepts and technologies to integrate and synchronize activities that prevent violent extremist organizations and rogue nation states from developing, acquiring, proliferating, or using WMD. This effort supports Commander, USSOCOM responsibilities under the Chairman, Joint Chiefs of Staff Unified Command Plan.

Counterforce technologies research develops, integrates, demonstrates, and transitions advanced sensors, surveillance, and target defeat planning technologies to enable the warfighter to hold WMD-related targets at risk. There are three core research efforts in this project: Technical Reconnaissance; Countering WMD (CWMD) weapons effects; and, Applied CWMD Computational, Physical and Life Science Research.

Target assessment technologies research develops, applies, and transitions processes and technologies providing advanced capabilities in the areas of Nuclear Advanced Automated Target Development (N-A2TD), WMD Targets Immersive Mission Planning (TIMP), and Full Dimensional Defeat Enterprise (FDDE). N-A2TD automates intelligence input to provide more realistic target input parameters incorporating 3-D models. WMD-TIMP provides an interactive virtual reality platform

for mission planning that mitigates impact of characterization uncertainty by allowing mission planners to execute multiple planning iterations with varied uncertainty parameters. FDDE aims to develop an enterprise capability for finding and identifying a facility, characterizing its function and physical layout, determining current or future vulnerabilities to available defeat mechanisms, planning and executing an attack, assessing damage, and denying reconstitution efforts. The dynamic capabilities encompassed
in this effort provide Combatant Commands (CCMDs) and the intelligence community tools and processes needed to hold at risk high value hard targets and WMD targets possessed by adversaries.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RG: Counter WMD Technologies and Capabilities Development	258.585	246.951	254.610
Description: Project RG develops advanced technologies and weapon concepts and validates their applicability to CWMD. ***FY 2023 Plans:*** - Improve Integrated Munitions Effects Assessment (IMEA) capability by integrating data model for more accurate modeling of buildings, bunkers, and tunnels used for storage of WMD. - Develop application interfaces for core IMEA functionality to interface with other targeting tools (e.g. Joint Targeting Toolbox (JTT), Digital Image Exploitation Engine (DIEE)), and intelligence databases (Modernized Intelligence Database (MIDB) and Machine-Assisted Analysis Rapid-Repository System (MARS)) - Initiate development of new tools to auto-generate customizable briefing materials for visualization to support target validation authority and CCMD's intent. - Complete modularization of IMEA code and transition to cloud computing/storage to support a multi-platform user environment capable of full-spectrum module archival/transition. - Complete IMEA capability to model cityscapes for target characterization. - Deliver Auto-Weaponeering System (AWeS) guided weaponeering tool utilizing neural networks for integration and distribution through IMEA. - Integrate Multi-Hit on multiple aim points for bunkers and tunnel solution recommendations into IMEA. - Conduct research and development to integrate sensor feeds directly to the Targeting Weaponeering Assistance Cell (TWAC) software for neural network analysis. - Deliver TWAC targeting recommendation packages and conduct training activities as requested by Combatant Commands - Provide TWAC systems engineering and integration support for both internal DTRA and external organizations with efforts related to CWMD and Hardened and Deeply Buried Targets (HDBT). - Support Combatant Commands with CWMD targeting and operational planning activities while identifying warfighting capability gaps. - Develop and test small unmanned aerial systems (UAS) for autonomous technical reconnaissance of a WMD target in denied area.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	**Project (Number/Name)** RG / *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Demonstrate next-generation sensor for radio-nuclide (RD) data collection in collaboration with the Department of Energy. - Develop offensive counter-proliferation, counter-WMD technologies in support of Combatant Command requirements. - Develop WMD pathway defeat technologies, and threat-specific test articles and analyses. - Develop lighter, smaller, more effective breaching capabilities. - Develop and test structural, reactive materials and advanced agent defeat concepts to improve the capability to defeat and/or neutralize WMD-related targets. ***FY 2024 Plans:*** - Provide offensive counter proliferation/CWMD facility defeat and critical node disruptive technologies. - Conduct USSOCOM SOF specific counter proliferation RDT&E to execute system integration and system demonstration for counter proliferation/CWMD technologies. Execute system test, evaluation, and development of tactics, techniques, and procedures. - Provide diagnostic and defeat RDT&E against emergent CWMD requirements for specific Explosive Ordnance Disposal (EOD) render safe operations. - Purchase additional access denial test articles with advanced development (specifically for Active Denial for Targets Right of the Line (ADTROL): seeker, warhead, communications). Conduct preliminary aircraft integration of ADTROL. - Conduct field testing of advanced sensor prototypes in collaboration with Air Force Technical Applications Center (AFTAC) for dual-use applications. Develop and deliver enhanced capability to perform magnetic characterization for time-sensitive targets. - Develop models to simulate combined kinetic and non-kinetic effects for WMD targets. Implement improvements for robust collateral damage estimates and uncertainty bounds. - Initiate Adversarial Weapons Asset Protection Toolkit (AWAPT) development for near-peer threat. - Develop and transition technology required to meet urgent CCMD needs for planned hybrid-warfare missions to counter WMD. - Mature the Full Dimensional Defeat Enterprise (FDDE) organization, functionality, and cross-functional CWMD Technical Assistance Group (TAG) to effectively utilize the agent-based modeling approach to system of systems analysis of WMD targets. - Expand functional agent libraries and facility templates, including larger system of facilities and cross-domain targeting. - Provide Analysis of Effect on WMD network domains, including consequences actions. - Develop models, leveraging legacy models, to create a 3-D immersive virtual reality environment for iterative mission planning. - Verification and validation of Nuclear-Automated Advanced Target Development (N-A2TD) prototype that provides more realistic target input parameters for more extensive and faster analytical results. - Deliver TWAC targeting recommendation packages and conduct training activities as requested by Combatant Commands. ***FY 2023 to FY 2024 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TEC HNOLOGY DEVELOPMENT*	**Project (Number/Name)** RG / *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
The decrease from FY 2023 to FY 2024 reflects non-recurring increases for congressional adds in FY 2023 for Detection and Tracking Technology and Advanced Manufacturing of Energetics.			
Accomplishments/Planned Programs Subtotals	258.585	246.951	254.610

	FY 2022	FY 2023
Congressional Add: Detection and Tracking Technology ***FY 2022 Accomplishments:*** - Developed a taggant system to track WMD items of interest through covert means. - Delivered a proof-of-concept integrated system consisting of a seismic based UGS, sUAS, taggant and application device. ***FY 2023 Plans:*** - Develop a prototype system to Detect, Tag and Track (DTT) mobile targets by placing a taggant on the mobile target to enable continuous tracking integrating unattended ground sensors (UGSs) that detect a target and subsequent intelligence, surveillance, reconnaissance (ISR) assets that attempt to find the target after a sensor detection report.	4.000	6.000
Congressional Add: Reduced Order Models ***FY 2022 Accomplishments:*** - Developed and implemented methodologies for Model Order Reduction (MOR) using data-driven (machine learning) Reduced Order Model (ROM) techniques on legacy code data, observation data, and first principles code simulation data to reduce run times for Counter WMD Modeling and Simulation tools. ***FY 2023 Plans:*** N/A	2.500	0.000
Congressional Add: Advanced Manufacturing of Energetics ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** - Design and develop novel Energetic Materials (EM) using advanced manufacturing techniques, such as Additive Manufacturing (AM), to combine Reactive Materials (RM) and known energetics into new materials whose scalable productions can be demonstrated.	0.000	5.000
Congressional Adds Subtotals	6.500	11.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	**Project (Number/Name)** RG / *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 23/0602718BR/RG: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	31.145	30.277	30.871	-	30.871	31.589	32.220	31.788	32.423	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TEC HNOLOGY DEVELOPMENT*	Project (Number/Name) RR / *CWMD TEST AND EVALUATION*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RR: *CWMD TEST AND EVALUATION*	0.170	4.639	9.530	8.225	-	8.225	7.908	7.928	6.016	6.136	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Countering WMD Test and Evaluation project provides a unique national test capability for simulated WMD facilities and processes. This capability provides structured and systematic end-to-end test event planning, preparation, management, execution, and data analysis. It also offers test instrumentation (data acquisition systems and optics), scientific analysis and predictions, test article construction, test article/test bed remediation, tunnel mining, architectural and engineering design, systems engineering and integration, and test data management. The project leverages 50 years of expertise in investigating weapons effects and target response across the spectrum of hostile environments that could be created by proliferative nations or terrorist organizations with access to advanced conventional weapons or WMD. Subject matter experts design full and sub-scale testing strategies focusing on weapon-target interaction with fixed soft and hardened facilities to include above ground facilities, cut-and-cover facilities, and deep underground tunnels.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RR: CWMD Test and Evaluation	4.639	9.530	8.225
Description: This project employs technology development, modeling-and-simulation, and analysis support tools to meet Combatant Command requirements and anticipated threats. DTRA provides timely acquisition and delivery of solutions that respond to asymmetric threat requirements and gaps.			
FY 2023 Plans: - Provide end-to-end test event planning, management, execution, and analysis supporting DoD, federal agencies', and friendly nations' programs to counter proliferation and defeat WMD. - Provide test articles, bunker and building construction, data acquisition systems, test optics, and data analysis. - Conduct test events, in conjunction with Combatant Commands and Services, that incorporate WMD threats on unmanned systems across multiple domains (land, air, and sea) that further incorporate automated and autonomous capabilities. - Document unique signatures of threat of unmanned systems operating at different levels of automation and autonomy and make available through DTRA's data architecture system to the broader USG community. - Conduct testing to understand blast propagation and associated wall damage from an internal explosion; develop simplified internal detonation and dispersion model for blast propagation through failing walls; update/validate blast propagation models in Integrated Munitions Effects Assessment (IMEA) and Vulnerability Assessment and Protection Option (VAPO).			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	**Project (Number/Name)** RR / *CWMD TEST AND EVALUATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Develop/validate models for blast propagation through failing walls (both light and heavy walls) for standard U.S. inventory-sized weapons (500#, 1000#, 2000# GBU); understand the blast and fragment environment in adjacent room for equipment damage estimates. ***FY 2024 Plans:*** - Develop intuitive, visual browser access to data and improve reliability of infrastructure services for assembly of large data sets for AI/ML development. - Generate data using software models to reduce cost and schedule of Test & Evaluation activities. - Provide end-to-end test event planning, management, execution, and analysis supporting DoD, federal agencies', and friendly nations' programs to counter proliferation and defeat WMD. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease from FY 2023 to FY 2024 is due to the realignment of resources within Project RR from PE 0603160BR to PE 0603176BR to fund system instrumentation, stabilization, and graphical user interface updates to better support customers in the areas of counter WMD and emerging threats.			
Accomplishments/Planned Programs Subtotals	4.639	9.530	8.225

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 23/0602718BR/RR: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	16.845	23.120	21.111	-	21.111	21.613	22.339	21.186	21.610	Continuing	Continuing
• 34/0603176BR/RR: *ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT*	0.000	6.505	7.990	-	7.990	7.962	7.934	7.102	7.244	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603176BR / *ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	6.505	7.990	-	7.990	7.962	7.934	7.102	7.244	Continuing	Continuing
RR: *CWMD TEST AND EVALUATION*	0.000	0.000	6.505	7.990	-	7.990	7.962	7.934	7.102	7.244	Continuing	Continuing

Note

On November 9, 2020, the Deputy Secretary of Defense directed the programmatic transfer of the National Assessment Group (NAG) from the Office of the Under Secretary of Defense for Acquisition & Sustainment (OUSD(A&S)) to DTRA for a better alignment of similar missions. This PE, established in the FY 2023 budget request includes the RDT&E funding associated with this transfer.

A. Mission Description and Budget Item Justification

The NAG conducts rapid, secure, and independent assessments of critical and unique technologies to support the Military Services, other government agencies, and DTRA. This rapid assessment group provides independent assessments of critical and unique technologies and capabilities for customers in the areas of counter WMD and emerging threats. The NAG provides an independent review/analysis and reporting of operational assessments, capability demonstrations, and test events.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	6.505	6.125	-	6.125
Current President's Budget	0.000	6.505	7.990	-	7.990
Total Adjustments	0.000	0.000	1.865	-	1.865
• 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	0.000	0.000			
• Realignments	-	-	1.865	-	1.865

Change Summary Explanation

The increase in FY 2024 from the previous President's Budget is due to increased investment in Project RR-CWMD Test and Evaluation funded by decreased investment in Project RR: CWMD Test and Evaluation in PE 0603160BR.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176BR / *ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT*	Project (Number/Name) RR / *CWMD TEST AND EVALUATION*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RR: *CWMD TEST AND EVALUATION*	0.000	0.000	6.505	7.990	-	7.990	7.962	7.934	7.102	7.244	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

On November 9, 2020, the Deputy Secretary of Defense directed the programmatic transfer of the National Assessment Group (NAG) from the Office of the Under Secretary of Defense for Acquisition & Sustainment (OUSD(A&S)) to DTRA for a better alignment of similar missions. This PE, established in the FY 2023 budget request includes the RDT&E associated with this transfer.

A. Mission Description and Budget Item Justification

The National Assessment Group (NAG) conducts rapid, secure, and independent assessments of critical and unique technologies to support the Military Services, other government agencies, and DTRA. This rapid assessment group provides independent assessments of critical and unique technologies and capabilities for customers in the areas of counter WMD and emerging threats. The NAG provides an independent review/analysis and reporting of operational assessments, capability demonstrations, and test events.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Project RR: CWMD Test and Evaluation	0.000	6.505	7.990
Description: Project RR conducts independent assessments, analyses, reviews, capability demonstrations and test events. ***FY 2023 Plans:*** - Conduct short/no notice unique technical assessments in support of DoD efforts to detect, deter, and defeat (D3) WMD threats. - Conduct threat replication testing using capabilities that support the DoD D3 mission. - Mission analysis will continue as this new program pivots full support to the Counter WMD mission space. ***FY 2024 Plans:*** - Assess new/novel CWMD technology and capabilities to strengthen joint force ability to defeat adversary threats. - Conduct assessments to verify and validate system/capability communication detectability to exploit adversary WMD vulnerabilities. - Assess non-traditional planning solutions development efforts for emergent threats and emergent WMD problems. ***FY 2023 to FY 2024 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603176BR / *ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT*	**Project (Number/Name)** RR / *CWMD TEST AND EVALUATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
The increase from FY 2023 to FY 2024 is due to the realignment of resources within Project RR from PE 0603160BR to PE 0603176BR to fund system instrumentation, stabilization, and graphical user interface updates to better support customers in the areas of counter WMD and emerging threats.			
Accomplishments/Planned Programs Subtotals	0.000	6.505	7.990

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 23/0602718BR/RR: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	16.845	23.120	21.111	0.000	21.111	21.613	22.339	21.186	21.610	Continuing	Continuing
• 33/0603160BR/RR: *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	4.639	9.530	8.225	0.000	8.225	7.908	7.928	6.016	6.136	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603260BR / *INTELLIGENCE ADVANCED DEVELOPMENT*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	0.000	10.000	-	10.000	11.000	7.000	0.000	0.000	Continuing	Continuing
RO: *CWMD EMERGING THREAT TECHNOLOGIES*	0.000	0.000	0.000	10.000	-	10.000	11.000	7.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Military intelligence provides timely, relevant, accurate, and synchronized intelligence and electronic warfare support to tactical, operational, and strategic-level commanders. It utilizes information collection and analysis approaches to provide guidance and direction to assist commander decision-making.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	10.000	-	10.000
Total Adjustments	0.000	0.000	10.000	-	10.000
• 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	0.000	0.000			
• Realignments	-	-	10.000	-	10.000

Change Summary Explanation

The increase in FY 2024 from the previous President's Budget is due to a realignment of $10 million from DTRA's Operation and Maintenance (O&M) funded Military Intelligence Program (MIP) account to this newly established RDT&E MIP PE. This funds a USD(I&S) directed project in support of a multi-agency Defense Department initiative.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603260BR / *INTELLIGENCE ADVANCED DEVELOPMENT*	Project (Number/Name) RO / *CWMD EMERGING THREAT TECHNOLOGIES*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RO: *CWMD EMERGING THREAT TECHNOLOGIES*	0.000	0.000	0.000	10.000	-	10.000	11.000	7.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a newly established Military Intelligence Program (MIP) PE in FY 2024. This is a new start.

A. Mission Description and Budget Item Justification

Military intelligence provides timely, relevant, accurate, and synchronized intelligence and electronic warfare support to tactical, operational, and strategic-level commanders. It utilizes information collection and analysis approaches to provide guidance and direction to assist commanders in their decisions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RO: CWMD Emerging Threat Technologies	-	-	10.000
Description: Project RO represents the RDT&E portion of DTRA's Military Intelligence Program. ***FY 2024 Plans:*** - Integrate DTRA capability development activities into Department of Defense global campaigns to counter Weapons of Mass Destruction (WMD) programs with focus on emerging threats from peer and near-peer adversaries and their proxies. - Support the Department of Defense community of interest that includes the Joint Staff and Combatant Commands and in collaboration with interagency and partner nations. - Enable Combatant Commanders and subordinate commands to integrate exquisite capabilities into global campaigns in order to hold the emerging technologies associated with WMD programs at risk. - Enable Combatant Commanders to deter and defeat devices, systems, networks and the associated tactics, techniques and procedures of those devices and systems that actors have designed, fielded or employed that may adversely impact U.S. forces and partners. - Integrate intelligence and operational requirements into the capability designs enabling globally integrated unified action to achieve specified effects in accordance with DoD strategic guidance from the Secretary of Defense, Joint Staff (JS) and Combatant Commands. ***FY 2023 to FY 2024 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603260BR / *INTELLIGENCE ADVANCED DEVELOPMENT*	**Project (Number/Name)** RO / *CWMD EMERGING THREAT TECHNOLOGIES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
The increase in FY 2024 is due to a realignment of $10 million from DTRA's Operation and Maintenance (O&M) funded Military Intelligence Program (MIP) account to this newly established RDT&E MIP PE. This funds a USD(I&S) directed project in support of a multi-agency Defense Department initiative.			
Accomplishments/Planned Programs Subtotals	-	-	10.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
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 0604551BR / *CATAPULT INFORMATION SYSTEM*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	8.110	6.979	7.130	8.328	-	8.328	7.475	7.625	7.777	7.933	Continuing	Continuing
RA: *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	8.110	6.979	7.130	8.328	-	8.328	7.475	7.625	7.777	7.933	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program designs, develops, tests, and delivers mission capabilities that support the ability to aggregate, and analyze data on global emerging threats and expedites DTRA's technology transition from the laboratory to operational use to reduce risk within the acquisition process. This is done by developing and deploying emerging technologies into our fully operational system through our Development, Security, and Operations (DevSecOps) pipeline.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	7.166	7.130	7.328	-	7.328
Current President's Budget	6.979	7.130	8.328	-	8.328
Total Adjustments	-0.187	0.000	1.000	-	1.000
• 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	-0.187	0.000			
• Realignments	-	-	1.000	-	1.000

Change Summary Explanation

The increase in FY 2024 from the previous President's Budget is due to increased investment in Project RA: CWMD Cross-Cutting Technical and Information Sciences for the Catapult Information System funded by decreased investment in Projects RA: CWMD Cross-Cutting Technical and Information Sciences, RD: Nuclear Technologies and Capabilities Development, and RR: CWMD Test and Evaluation in PE 0603160BR.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604551BR / *CATAPULT INFORMATION SYSTEM*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RA: *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	8.110	6.979	7.130	8.328	-	8.328	7.475	7.625	7.777	7.933	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project enables DTRA's Catapult Information System Program to design, develop, test and deliver mission capabilities that support the ability to aggregate and analyze data on global emerging threats, threat actors and threat networks. Catapult allows DTRA to rapidly develop, engineer, test and deploy analytical tools, data science methodologies and software applications in support of the warfighter. Catapult and its associated Attack the Network Tool Suite (ANTS) integrates data sources that support the detection and identification of emerging threats, threat networks and actors, command and control, operations, intelligence, and engagement for neutralizing, attacking and defeating both current and emerging threats and threat networks.

Catapult uses its RDT&E funding to meet user needs using tools and services that reside in Catapult, a cloud technology-based data analytics platform developed and delivered by DTRA that provides an extensible, continuously augmented, real-time repository of data on emerging threats and worldwide threat actors. Catapult is fully operational and accredited on the Secret Internet Protocol Router Network (SIPRNet) and Joint Worldwide Intelligence Communications System (JWICS). The Catapult architecture pulls from more than 850 data sources on SIPRNet and more than 170 data sources on JWICS. Catapult uses ANTS tools and services to provide national-level capabilities for data and information capture, discovery, access, aggregation, correlation, visualization, analysis, sharing, and distribution for users from the strategic level to the tactical edge.

This project achieves transformational mission capabilities and postures the Agency to meet emerging mission requirements through innovative technology solutions and service upgrades.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	6.979	7.130	8.328
Description: This project enables DTRA's Catapult Information System Program to design, develop, test, and deliver mission capabilities that support the ability to aggregate and analyze data on global emerging threats. Catapult allows DTRA to rapidly develop, engineer, test and deploy analytical tools, data science methodologies and software applications in support of the warfighter. The project achieves transformational mission capabilities and postures the Agency to meet emerging mission requirements through innovative technology solutions and service upgrades.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604551BR / *CATAPULT INFORMATION SYSTEM*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Develop predictive Data Science models through supervised and unsupervised Machine Learning (ML) against current and emerging threats; including fusion of multi-INT data across unclassified and classified data sets to identify networks and locations of interest to DTRA and its mission partners. - Integrate ML-driven application features into ANTS capabilities, such as ML JavaScript libraries, to enhance human-centered design of applications and tailor individual access to applications to improve user experience. - Develop an Active Learning-enabled extension to the data annotation platform to accelerate preparation of training sets for both new and retrained machine learning models. - Develop a Named Entity Recognition (NER) enhancement using machine learning techniques to expand the scope of captured entities, including events, location features, person attributes and affiliations. - Integrate a query expansion capability to automatically recommend keywords in the corpus of documents as users are typing queries; accelerate document discovery and enhance information retrieval features in ANTS applications. - Automate the process of labeling data for supervised machine learning by integrating labeling functions or custom recipes. - Modernize the Catapult data model using JADC2-recognized formats, such as National Information Exchange Model (NIEM), or other open and recognized data model standards to improve the cross-compatibility of the Catapult corpus with other data repositories in the DoD. - Standardize open API services to adhere to JADC2 recommendations to improve data accessibility by using familiar lexicon, formats and techniques for retrieving data by data-as-a-service subscribers and citizen data scientists. - Develop the Next Generation of the Catapult Information System to align to the Joint All Domain Command and Control and Joint Warfighting Concept.			
FY 2024 Plans: - Develop predictive Data Science models through supervised and unsupervised Machine Learning (ML) against current and emerging threats; including fusion of multi-INT data across unclassified and classified data sets to identify networks and locations of interest to DTRA and its mission partners. - Continue the modernization of Catapult's data model using JADC2-recognized formats, such as National Information Exchange Model (NIEM), or other open and recognized data model standards to improve the cross-compatibility of the Catapult corpus with other data repositories in the DoD. - Continue to standardize open API services to adhere to JADC2 recommendations to improve data accessibility by using familiar lexicon, formats and techniques for retrieving data by data-as-a-service subscribers and citizen data scientists. - Develop the Next Generation of the Catapult Information System to align to the Joint All Domain Command and Control and Joint Warfighting Concept. - Design and implement a cross domain solution to enable data sharing across enclaves.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604551BR / *CATAPULT INFORMATION SYSTEM*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
The increase from FY 2023 to FY 2024 funds system upgrades for new CWMD mission related data feeds, cross-domain solutions, and system modifications to enable allies and strategic partners access to the Catapult Information System.			
Accomplishments/Planned Programs Subtotals	6.979	7.130	8.328

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 23/0602718BR/RA: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	45.294	3.140	37.218	-	37.218	37.914	29.639	30.543	31.213	Continuing	Continuing
• 33/0603160BR/RA: *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	76.268	78.991	86.415	-	86.415	90.571	88.687	89.660	92.136	Continuing	Continuing
• 144/0605502BR/ RA: *SMALL BUSINESS INNOVATION RESEARCH*	16.870	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

N/A

D. Acquisition Strategy

Assessment and selection of best performers to provide contractual services to develop and operationalize requirements through the IMAX contract to minimize cost and technical risk. Performer base selection includes research developers across DoD and other Government agency laboratories, academia, and industry.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604551BR / *CATAPULT INFORMATION SYSTEM*	Project (Number/Name) RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Catapult Information System	C/CPAF	Booz Allen Hamilton : Reston, VA	5.218	5.782	Jun 2022	6.140	Jul 2023	7.328	Jul 2024	0.000		7.328	Continuing	Continuing	24.468
		Subtotal	5.218	5.782		6.140		7.328		0.000		7.328	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Catapult Information System	C/CPAF	Booz Allen Hamilton : Reston, VA	0.917	0.000	Jun 2022	0.000		0.000		0.000		0.000	0.000	0.917	0.917
		Subtotal	0.917	0.000		0.000		0.000		0.000		0.000	0.000	0.917	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Catapult Information System	C/CPAF	Booz Allen Hamilton : Reston, VA	0.500	0.963	Jun 2022	0.990	Jun 2023	1.000	Jul 2024	0.000		1.000	Continuing	Continuing	3.453
SETA - Capability Research Architecture Cell (CRAC)	C/CPAF	TBD : Ft. Belvoir, VA	1.475	0.000		0.000		0.000		0.000		0.000	0.000	1.475	0.000
TACEON	C/CPAF	Booz Allen Hamilton : Reston, VA	0.000	0.234	Jun 2022	0.000		0.000		0.000		0.000	0.000	0.234	0.000
		Subtotal	1.975	1.197		0.990		1.000		0.000		1.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604551BR / *CATAPULT INFORMATION SYSTEM*	Project (Number/Name) RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.110	6.979		7.130		8.328		0.000		8.328	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604551BR / *CATAPULT INFORMATION SYSTEM*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*

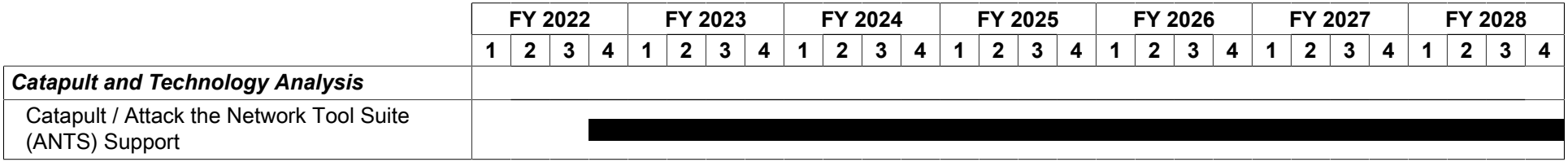


Exhibit R-4A, RDT&E Schedule Details: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604551BR / *CATAPULT INFORMATION SYSTEM*	**Project (Number/Name)** RA / *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Catapult and Technology Analysis				
Catapult / Attack the Network Tool Suite (ANTS) Support	4	2022	4	2028

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605000BR *I COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	25.120	13.695	14.403	14.414	-	14.414	14.341	14.569	16.922	17.260	Continuing	Continuing
RD: *Nuclear Technologies and Capabilities Development*	25.120	13.695	14.403	14.414	-	14.414	14.341	14.569	16.922	17.260	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter Weapons of Mass Destruction (CWMD) Systems Development program element supports the development and demonstration of technologies and systems for the CWMD mission, including modeling and simulation (M&S) capabilities, verification and monitoring technologies, and decision support systems.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	14.063	14.403	13.414	-	13.414
Current President's Budget	13.695	14.403	14.414	-	14.414
Total Adjustments	-0.368	0.000	1.000	-	1.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.368	-			
• Realignments	-	-	1.000	-	1.000

Change Summary Explanation

The increase in FY 2024 from the previous President's Budget is due to increased investment in Project RD: Nuclear Technologies and Capabilities Development for nuclear and radiological effects funded by decreased investment in this Project (RD) within PE 0603160BR.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	Project (Number/Name) RD / *Nuclear Technologies and Capabilities Development*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RD: *Nuclear Technologies and Capabilities Development*	25.120	13.695	14.403	14.414	-	14.414	14.341	14.569	16.922	17.260	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the development of capabilities for the Defense Threat Reduction Agency (DTRA) to counter proliferation and weapons of mass destruction (WMD) and to model the consequences of the use of nuclear weapons and integrate these capabilities for Combatant Command use.

DTRA's Enhanced Consequence Analysis (ECA) program performs research and development to improve the reliability and effectiveness of capabilities related to the consequence of execution of a nuclear weapon. This program delivers nuclear weapon effects (NWE) decision support tools for use during strategic and operational planning. The ECA program directly supports U.S. and allied warfighter planning requirements, including the Integrated Strategic Planning and Analysis Network Increment 5 (ISPAN Inc 5), an acquisition category (ACAT) 1A Major Automated Information System (MAIS) that supports developing nuclear and conventional force application plans.

DTRA's Nuclear Arms Control Technologies (NACT) program performs research and development to improve the sustainability, reliability, and effectiveness of capabilities related to its operational mission to install, operate, maintain, and sustain the waveform and radionuclide nuclear detonation detection stations and a radionuclide analysis laboratory comprising the majority of the U.S. portion of the International Monitoring System (IMS). This system delivers data continuously to the U.S. monitoring and verification community supporting warfighter and interagency nuclear-event response in support of the U.S. and Department of Defense (DoD). The NACT program directly supports U.S. and allied warfighter and national technical monitoring requirements and provides vital data used by the treaty monitoring community, warfighter planners, DoD, other U.S. Government agencies, and international agencies.

The Nuclear Capabilities Services (NuCS) program performs RDT&E to improve capabilities to model nuclear weapon effects (NWE) environments and simulate the response of systems and networks to these effects. Starting with NWE modeling & simulation (M&S) capabilities rooted in the DoD nuclear testing program, NuCS augments these legacy codes through integration of higher-fidelity reduced-order models built by DTRA applied research efforts that combine first-principle science & technology M&S and experimental research. Through technology updates to legacy codes and integration of new models, NuCS provide a standard source of NWE M&S capabilities for all DoD users. The ECA program integrates NuCS capabilities and these M&S capabilities with operational databases and systems and works with end-users to provide a user experience specifically designed for nuclear planning. Together, these programs support United States and allied planning and decision making in the event of nuclear weapon use.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RD - Nuclear Technologies and Capabilities Development	13.695	14.403	14.414

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Description: Project RD supports the NuCS, NACT, and ECA programs, conducting RDT&E to support U.S. and allied nuclear planning and decision-making requirements. ***FY 2023 Plans:*** Nuclear Signature Monitoring – Signature Evaluation: - Develop geographically expanded monitoring capability and algorithms for detection of new threats, Conventional-Nuclear Integration (CNI), and verification of covert nuclear signatures. - Integrate nuclear and radionuclide data into Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) Consequence Management Response Force (CCMRF) Exercises to provide realistic scenarios for emergency response to nuclear events. - Characterize waveform signals from Cooperative Threat Reduction leveraged large-scale high-explosive tests at Soviet test sites to reduce uncertainty in nuclear effects models. International Monitoring System (IMS) - Signature Exploitation / Dual Use: - Expand digitization of nuclear testing data to other test sites and integrate into Waveforms From Nuclear Explosions (WFNE) to reduce uncertainty in nuclear effect models. - Improve and reduce uncertainty of infrasound propagation models for both IMS and other strategic DoD missions. - Expand characterization of waveform signals application to military mission and reduce uncertainty in nuclear effects models through detailed analysis of high-explosive coupling experiments. Nuclear Signature Monitoring - Signature Availability/System Performance: - Design the 32nd of 32 U.S. IMS stations to demonstrate U.S. commitment and keep pace with other State Signatories' installation of 300 out of 321 (93%) stations. - Design the next-generation particulate monitoring station for dual-use to support both IMS and other strategic DoD missions. - Increase nuclear and radionuclide data provided from existing networks and sensors through the DTRA Joint Operations Center (JOC) to support Combatant Commands (CCMDs). ***FY 2024 Plans:*** - Integrate nuclear weapon effects software capabilities prioritized by ECA users in a cloud-ready architecture that has been tested and evaluated to function under expected operational conditions. - Integrate new and requested capabilities into cloud-ready USSTRATCOM, UK/MoD and NATO/SHAPE nuclear planning tools. - Develop algorithms to enable transition of infrasound propagation models to DoD systems and develop prototype of next generation International Monitoring System (IMS) radionuclide lab analysis capability.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Deliver improved "state of health" IMS performance and predictive algorithms and monitoring arrays using AI/ML techniques from legacy U.S. IMS data. - Demonstrate an emerging-threat monitoring capability that leverages current systems and complete comprehensive analyses of sensor data from DTRA/DOS/NNSA high-explosive experiments. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** There is no significant change from FY 2023 to FY 2024.			
Accomplishments/Planned Programs Subtotals	13.695	14.403	14.414

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 23/0602718BR/RD: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	97.766	106.095	119.670	-	119.670	120.980	122.543	119.240	121.625	Continuing	Continuing
• 33/0603160BR/RD: *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	53.969	60.249	51.697	-	51.697	52.341	54.236	53.596	54.667	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assess government, academic, and industrial performers and make selections based upon a "best fit for task" criteria. Common government awardees include DoD Service Laboratories and the Department of Energy National Laboratories.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enhanced Consequence Analysis (ECA) capability development	C/CPFF	Booz Allen Hamilton : McLean, VA	2.555	2.100	Nov 2021	1.970	Mar 2023	1.861	Nov 2023	-		1.861	Continuing	Continuing	-
Nuclear Capabilities Service (NuCS) nuclear weapon effects models and integration development	C/CPFF	Applied Research Associates : Raleigh, NC	0.000	1.400	Nov 2021	1.535	Mar 2023	2.403	Dec 2023	-		2.403	Continuing	Continuing	-
		Subtotal	2.555	3.500		3.505		4.264		-		4.264	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Radionuclide sensor, station, laboratory and network improvements	FFRDC	Pacific Northwest National Laboratory : Richland, WA	2.762	1.236	Jan 2022	1.785	Jan 2023	1.084	Dec 2023	-		1.084	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	FFRDC	Sandia National Laboratory : Albuquerque, NM	3.094	1.377	Jan 2022	1.589	Jan 2023	0.900	Dec 2023	-		0.900	Continuing	Continuing	-
Radionuclide sensor, station, and network Improvements	MIPR	Air Force Technical Application Center : Patrick AFB, FL	0.890	0.398	Feb 2022	0.350	Jan 2023	-		-		-	Continuing	Continuing	-
Radionuclide sensor, station, laboratory and network improvements	C/CPFF	General Dynamics Mission Systems, Inc. : Fairfax, VA	0.881	0.455	Nov 2021	0.750	Nov 2022	0.788	Nov 2023	-		0.788	Continuing	Continuing	-
Station, and network Improvements	C/CPFF	Leidos Innovations Corp : Alexandria, VA	0.440	0.245	Nov 2021	0.250	Mar 2023	0.750	Mar 2024	-		0.750	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	Project (Number/Name) RD / *Nuclear Technologies and Capabilities Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	Pennsylvania State University : State College, PA	0.850	0.459	Jan 2022	0.275	Feb 2023	0.300	Feb 2024	-		0.300	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	C/CPFF	University of Alaska Fairbanks : Fairbanks, AK	0.143	0.000		0.395	Mar 2023	0.411	Mar 2024	-		0.411	Continuing	Continuing	-
Integrated Munitions Effects Assessment Software Development	C/CPFF	Applied Research Associates, Inc : Alexandria, VA	0.400	0.204	Feb 2022	0.000		-		-		-	0.000	0.604	-
Radionuclide sensor, station, laboratory and network improvements	FFRDC	Argonne National Laboratory : Argonne, IL	0.200	0.000		0.602	Mar 2023	0.400	Mar 2024	-		0.400	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	MIPR	University Affiliated Research Center, University of Alaska : Fairbanks, AK	0.660	0.510	Mar 2022	0.695	Feb 2023	0.650	Jan 2024	-		0.650	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	U.S. Army Corps of Engineers : Vicksburg, MS	0.400	0.306	Jan 2022	0.000		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	Missile Defense Agency : Fort Belvoir, VA	0.650	0.000		0.000		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	Geophysical Detection for Non-Proliferation University Affiliated Research Center, University of Alaska : Fairbanks, AK	0.706	0.510	Feb 2022	0.000		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	Project (Number/Name) RD / *Nuclear Technologies and Capabilities Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Radionuclide sensor, station, and network Improvements	FFRDC	Savanah River National Laboratory : Savannah River Site Aiken, SC	1.154	0.765	Mar 2022	0.300	Mar 2023	-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	DIA/MSIC : TBD	0.250	0.255	Mar 2022	0.000		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	FFRDC	Lawrence Livermore National Laboratory : Livermore, CA	0.950	0.969	Jan 2022	0.000		-		-		-	Continuing	Continuing	-
Radionuclide sensor, station, and network Improvements	C/CPFF	Draper : Cambridge, MA	3.000	0.000		0.300	Jan 2023	0.250	Feb 2024	-		0.250	Continuing	Continuing	-
Enhanced consequence analysis initial capability	C/CPFF	TBD : TBD	5.000	0.000		0.000		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	C/CPFF	National Nuclear Center of Kazakhstan : Kazakhstan	0.000	0.000		0.550	Dec 2022	-		-		-	Continuing	Continuing	-
Applied Research Associates : Albuquerque, NM	C/CPFF	Applied Research Associates : Albuquerque, NM	0.000	0.000		0.450	Dec 2022	-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; comprehensive analysis of high explosive experiments	FFRDC	Lawrence Livermore National Laboratory : Livermore, CA	-	-		-		0.450	Dec 2023	-		0.450	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements;	C/CPFF	Applied Research Associates : Arlington, VA	-	-		-		0.350	Feb 2024	-		0.350	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	Project (Number/Name) RD / *Nuclear Technologies and Capabilities Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
comprehensive analysis of high explosive experiments															
		Subtotal	22.430	7.689		8.291		6.333		-		6.333	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enhanced Consequence Analysis (ECA) T&E	C/CPFF	Booz Allen Hamilton : McLean, VA	0.000	1.200	Nov 2021	1.020	Mar 2023	1.982	Nov 2023	-		1.982	Continuing	Continuing	-
NuCS T&E	C/CPFF	Applied Research Associates : Raleigh, NC	0.000	0.500	Nov 2021	0.000		1.754	Dec 2023	-		1.754	Continuing	Continuing	-
NuCS T&E	TBD	TBD : TBD	0.000	0.692	Mar 2022	1.475	Mar 2023	-		-		-	Continuing	Continuing	-
		Subtotal	0.000	2.392		2.495		3.736		-		3.736	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Reqn	Various : Various	0.135	0.114	Nov 2021	0.112	Nov 2022	0.081	Nov 2023	-		0.081	Continuing	Continuing	-
		Subtotal	0.135	0.114		0.112		0.081		-		0.081	Continuing	Continuing	N/A

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	25.120	13.695		14.403		14.414		-		14.414	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

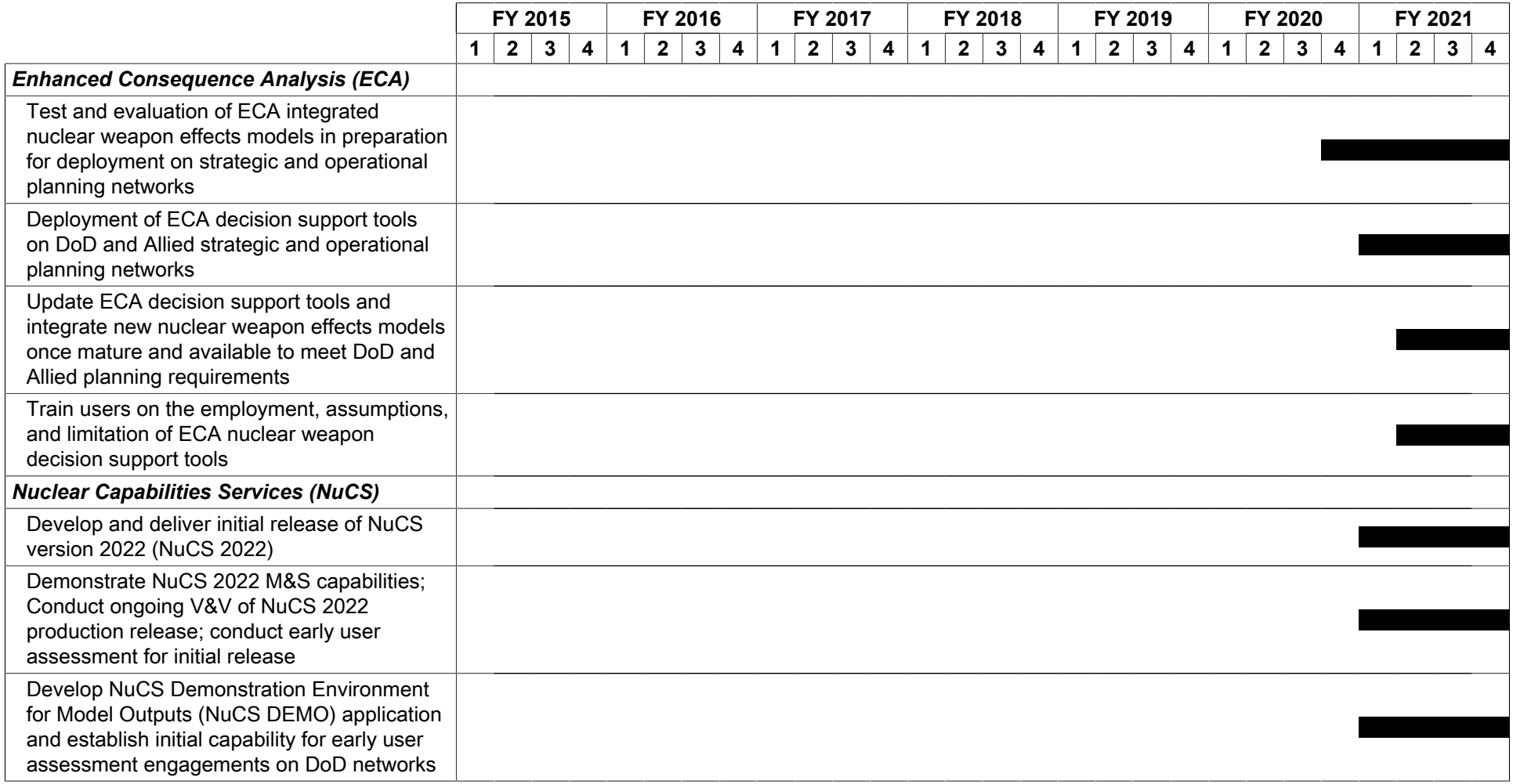
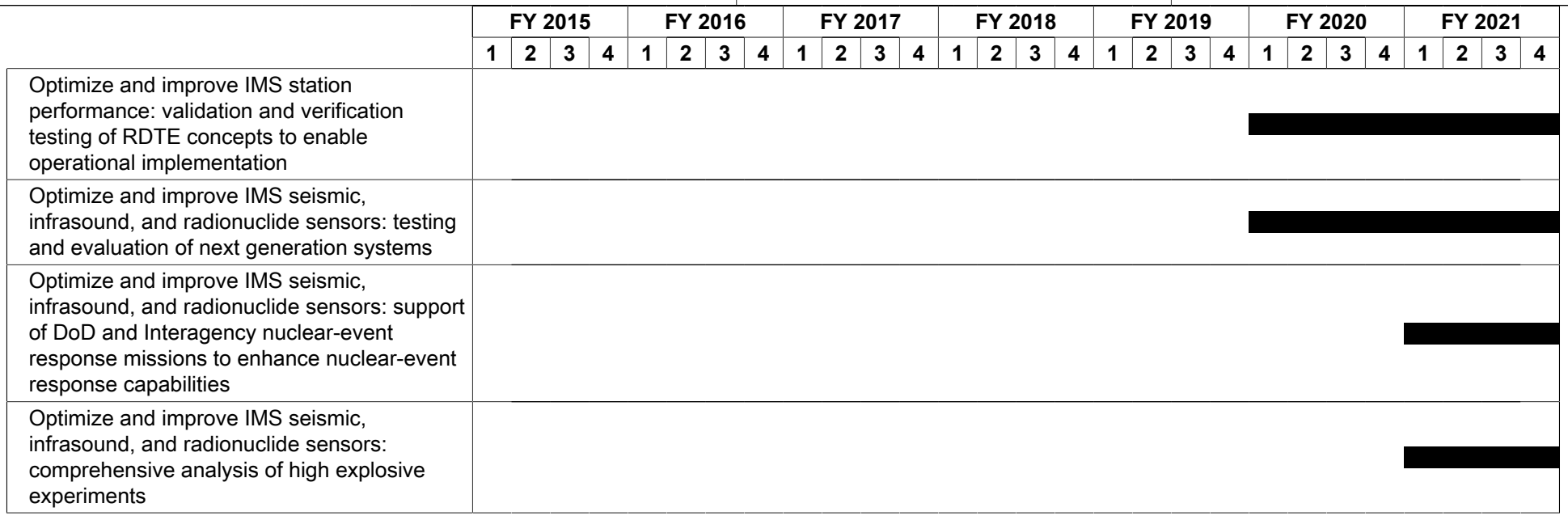


Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop initial training materials for NuCS 2022 production release; release training materials																												
Conduct annual user review; implement changes to NuCS products; release NuCS 2023																												
Conduct annual user review; implement changes to NuCS products; release NuCS 2024																												
Conduct annual user review; implement changes to NuCS products; release NuCS 2025																												
Conduct annual user review; implement changes to NuCS products; release NuCS 2026																												
Conduct annual user review; implement changes to NuCS products; release NuCS 2027																												
Conduct annual user review; implement changes to NuCS products; release NuCS 2028																												
Conduct annual training review of training materials for users, develop new training materials based on changes made to annual release as required																												
Nuclear Arms Control Technology																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors																												

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*



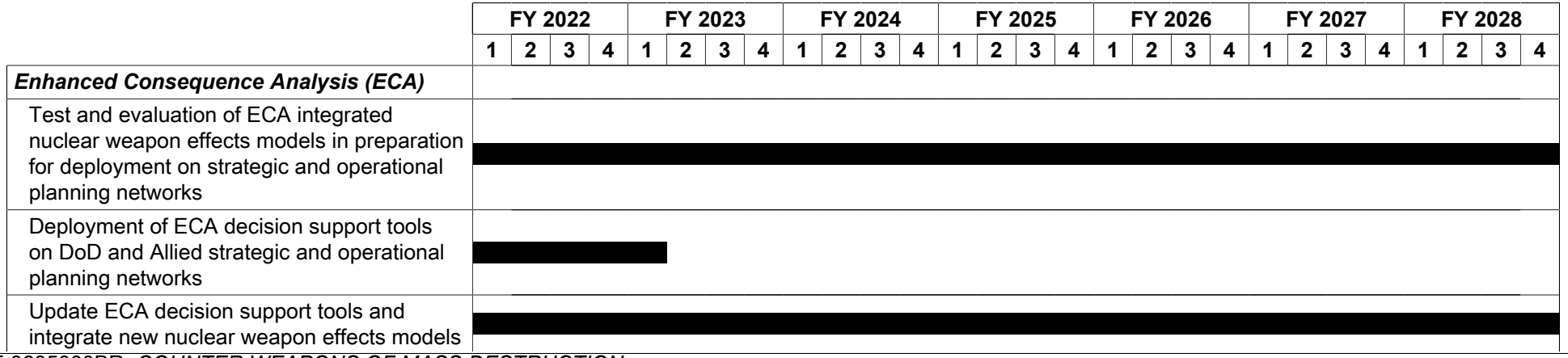


Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

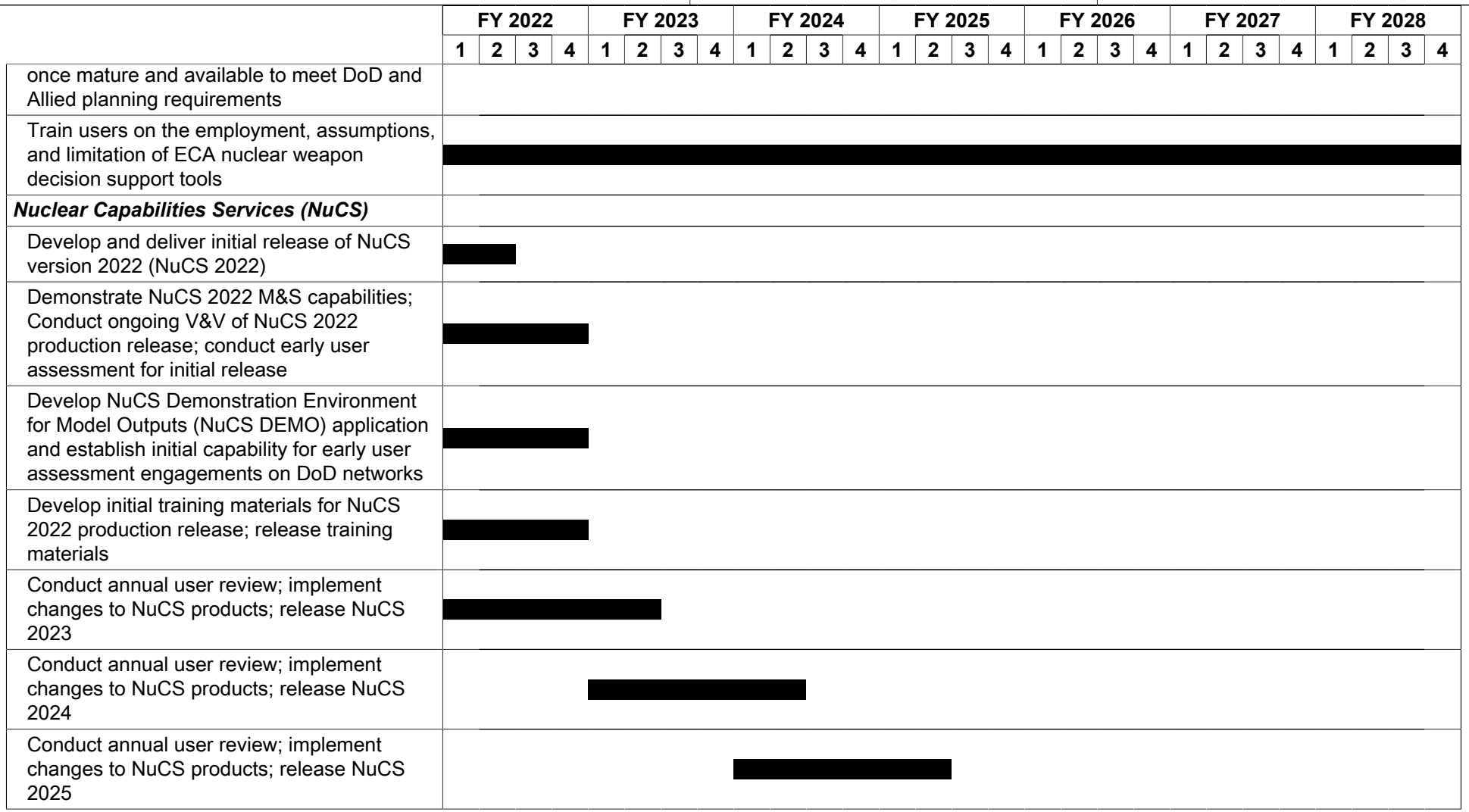


Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

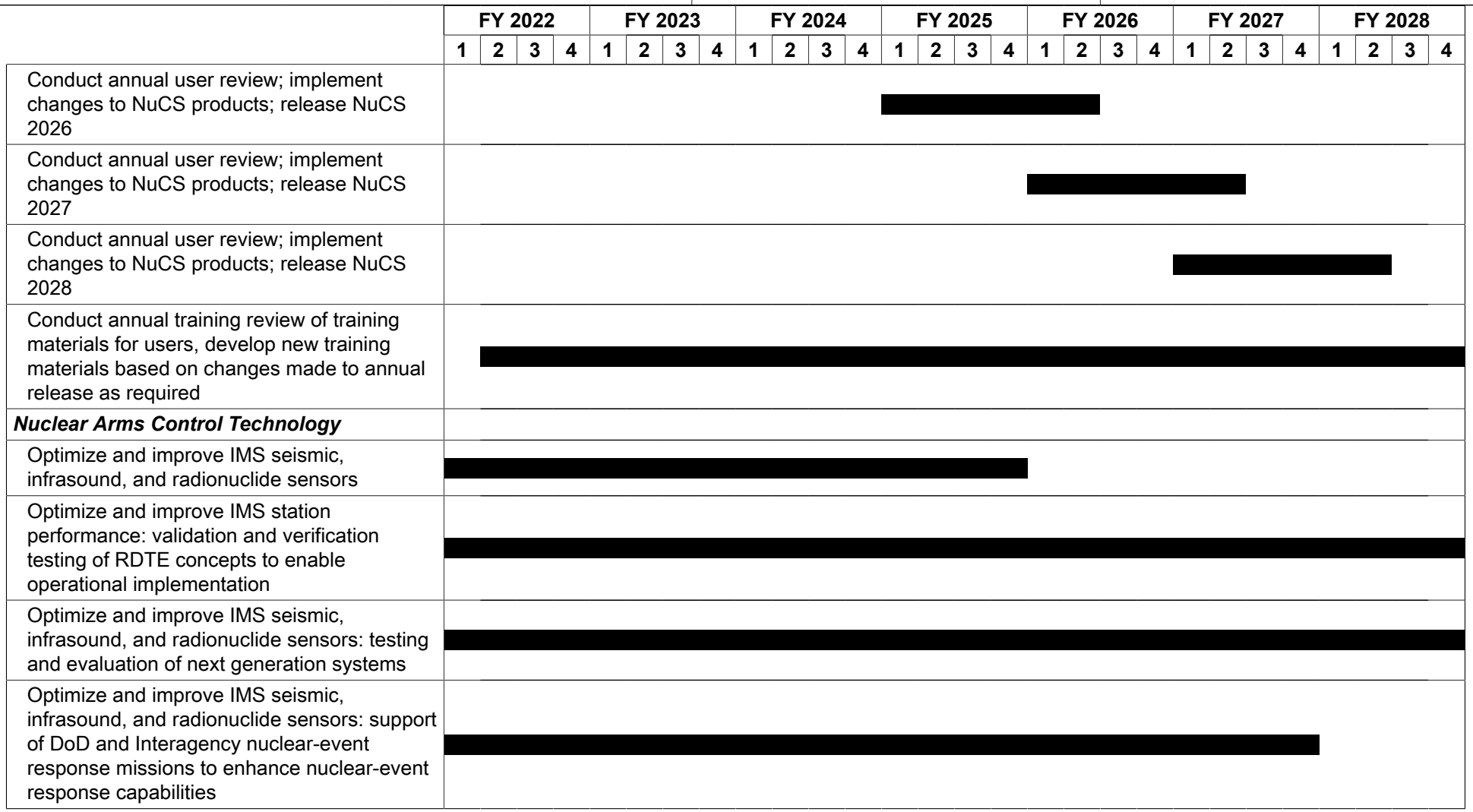


Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: comprehensive analysis of high explosive experiments																												

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Enhanced Consequence Analysis (ECA)				
Test and evaluation of ECA integrated nuclear weapon effects models in preparation for deployment on strategic and operational planning networks	4	2020	4	2028
Deployment of ECA decision support tools on DoD and Allied strategic and operational planning networks	1	2021	1	2023
Update ECA decision support tools and integrate new nuclear weapon effects models once mature and available to meet DoD and Allied planning requirements	2	2021	4	2028
Train users on the employment, assumptions, and limitation of ECA nuclear weapon decision support tools	2	2021	4	2028
Nuclear Capabilities Services (NuCS)				
Develop and deliver initial release of NuCS version 2022 (NuCS 2022)	1	2021	2	2022
Demonstrate NuCS 2022 M&S capabilities; Conduct ongoing V&V of NuCS 2022 production release; conduct early user assessment for initial release	1	2021	4	2022
Develop NuCS Demonstration Environment for Model Outputs (NuCS DEMO) application and establish initial capability for early user assessment engagements on DoD networks	1	2021	4	2022
Develop initial training materials for NuCS 2022 production release; release training materials	1	2021	4	2022
Conduct annual user review; implement changes to NuCS products; release NuCS 2023	1	2022	2	2023
Conduct annual user review; implement changes to NuCS products; release NuCS 2024	1	2023	2	2024
Conduct annual user review; implement changes to NuCS products; release NuCS 2025	1	2024	2	2025

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Conduct annual user review; implement changes to NuCS products; release NuCS 2026	1	2025	2	2026
Conduct annual user review; implement changes to NuCS products; release NuCS 2027	1	2026	2	2027
Conduct annual user review; implement changes to NuCS products; release NuCS 2028	1	2027	2	2028
Conduct annual training review of training materials for users, develop new training materials based on changes made to annual release as required	2	2022	4	2028
Nuclear Arms Control Technology				
Optimize and improve IMS seismic, infrasound, and radionuclide sensors	1	2022	4	2025
Optimize and improve IMS station performance: validation and verification testing of RDTE concepts to enable operational implementation	1	2020	4	2028
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: testing and evaluation of next generation systems	1	2020	4	2028
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: support of DoD and Interagency nuclear-event response missions to enhance nuclear-event response capabilities	1	2021	4	2027
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: comprehensive analysis of high explosive experiments	1	2021	4	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	5.500	5.356	14.093	9.316	-	9.316	9.440	9.573	9.702	9.896	Continuing	Continuing
MA: *Mission Assurance Risk Management System*	5.500	5.356	14.093	9.316	-	9.316	9.440	9.573	9.702	9.896	Continuing	Continuing

A. Mission Description and Budget Item Justification

MARMS is a Department of Defense (DoD) risk management system that directly supports the Secretary of Defense Mission Assurance (MA) responsibilities as defined in the DoD Directive (DoDD) 3020.40, Mission Assurance, with the objectives of creating resilience and supporting critical processes to enable the protection of assets and ensuring defense critical missions across 17 Mission Assurance Related Programs and Activities (MARPA). MARMS functions as an integration framework spanning multiple security domains that will support risk-informed decision-making, resource investment, and improved synchronization at different levels within DoD.

MARMS supports multiple Joint Capability Areas (JCA): Command and Control, Logistics, and Protection. MARMS is a joint program and an acquisition category (ACAT) III software-intensive and situational awareness program in the agile-based Adaptive Acquisition Framework – Software Pathway (AAF-SWP). MARMS has Risk Management Framework (RMF) security controls in place to protect the Mission Assurance data with a "high" impact value for confidentiality and integrity, and “medium” for the availability security objectives in accordance with DoD Instruction (DoDI) 8510.01 and the Committee on National Security Systems Instruction (CNSSI) 1253.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	5.500	14.093	9.316	-	9.316
Current President's Budget	5.356	14.093	9.316	-	9.316
Total Adjustments	-0.144	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.144	-			

Change Summary Explanation

No change in FY 2024 from the previous President's Budget.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*	Project (Number/Name) MA / *Mission Assurance Risk Management System*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MA: *Mission Assurance Risk Management System*	5.500	5.356	14.093	9.316	-	9.316	9.440	9.573	9.702	9.896	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MARMS is a Department of Defense (DoD) risk management system that directly supports the Secretary of Defense's Mission Assurance (MA) responsibilities as defined in the DoD Directive (DoDD) 3020.40, Mission Assurance, with the objectives of creating resilience and supporting critical processes to enable the protection of assets and ensuring defense critical missions. MARMS will function as an integration framework spanning multiple security domains that will support risk-informed decision-making, resource investment, and improved synchronization at different levels within DoD. MARMS supports multiple Joint Capability Areas (JCA): Command and Control, Logistics, and Protection. MARMS is an acquisition category (ACAT) III software program and has a "high" impact value for confidentiality and integrity, and “medium” for the availability security objective in accordance with DoD Instruction (DoDI) 8510.01 and the Committee on National Security Systems Instruction (CNSSI) 1253.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: MA - Mission Assurance Risk Management System	5.356	14.093	9.316
Description: MARMS is a multi-year enduring program that will federate a family of MA systems to be integrated as an enterprise solution defined in the MARMS Information System Initial Capabilities Document (IS-ICD) and Requirements Definition Package (RDP) for Increment 1. The RDP-1 defines multiple spirals of major technological improvements. Each spiral is comprised of multiple Capability Drops (CD) that define specific capabilities. RDP-1 defines seven capability drops focusing on the collection, analysis, warehousing, sharing, protection, and accessing of Defense Critical Infrastructure (DCI) and Anti-Terrorism (AT) data to support risk-informed decision making, resource investment and improve synchronization across Mission Assurance-related programs for Increment 1.			
FY 2023 Plans: - Develop MARMS Increment 2 adding integration of DoD risk-based data for the next three Mission Assurance Related Programs and Activities (MARPAs): DoD Cybersecurity, Energy Resilience (ER), & Emergency Management (EM). - Develop base capability (Data Registry, Enterprise Viewer, Cross Domain) for new Unclassified MARMS Architecture to support three new MARPAs. - Develop enhancements to existing Unclassified/SIPR/Top Secret systems that support the new MARPAs. - Transition from USAF's Enterprise Protection Risk Management system to an alternate platform. - Establish new hosting, accreditation, and development as needed to supporting AT and DCI assessments.			
FY 2024 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*	**Project (Number/Name)** MA / *Mission Assurance Risk Management System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Improve the core DTRA capabilities of the Information Sharing Registry (CD1) and the Mission Assurance Viewer and Analysis Portal on SIPR to continue to enhance the capability and improve data management for the Antiterrorism (AT) and MA/DCI risk data. - Build out and populate data for the new instance of the Mission Assurance Viewer and Analysis Portal on JWICS (CD5). - Build out the Mission Assurance Assessment Module for the Service-level Mission Assurance Assessments in the Assessment Module (CD2) and new modules for other Increment 2 validated joint requirements. - Develop and populate data within base capability [Data Registry, Enterprise Viewer, Cross Domain] for Unclassified MARMS Architecture to support Increment 2 MARPAs. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The decrease from FY 2023 to FY 2024 is due to a non-recurring investment in FY 2023 to accelerate MARMS Increment 2 development.			
Accomplishments/Planned Programs Subtotals	5.356	14.093	9.316

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy for MARMS is based on its designation as a joint DoD program and being a software-intensive and situational awareness program. Therefore, it is aligned to follow the acquisition construct defined by the agile-based DoDI 5000.87 Adaptive Acquisition Framework – Software Pathway (AAF-SWP). In order to accomplish the Mission Assurance Strategy and Policy of aligning and integrating the risk based data for the 17 Mission Assurance Related Programs and Activities (MARPA), the MARMS PMO will build on the initial foundational/baseline information technology capabilities and data integration investments for Increments 1 and 2 for the remaining MARPAs per the guidance of the Deputy Assistant Secretary of Defense for Defense Continuity and Mission Assurance (DASD-DC&MA) and the Joint Staff J36 Mission Assurance Branch. Joint Capabilities Integration and Development System (JCIDS) IT-Box terminology of Modernize and Integrate, IOC/FOC, will be phased out with continuous Development, Security, and Operations (DevSecOps) as an enduring program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*	**Project (Number/Name)** MA / *Mission Assurance Risk Management System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mission Assurance and Risk Management System (MARMS) Secret Internet Protocol Router (SIPR) Hosting	MIPR	U.S. Army ALTESS : Radford, VA	0.000	0.126	Apr 2022	0.130	Dec 2022	0.175	Dec 2023	-		0.175	Continuing	Continuing	-
MARMS Unclassified Hosting & DevSecOps	MIPR	NGA : Springfield, VA	0.000	0.000		0.600	Feb 2023	0.600	Feb 2024	-		0.600	Continuing	Continuing	-
MARMS SIPR Hosting - Cloud DCDSCOOP	C/CPFF	GSA IT Sched 70 : Amazon AWS	0.000	0.000		0.100	Jul 2023	0.100	Jul 2024	-		0.100	Continuing	Continuing	-
MARMS JWICS Hosting	MIPR	Defense Intelligence Agency : Washington D.C.	0.000	0.000		0.100	Dec 2022	0.100	Dec 2023	-		0.100	Continuing	Continuing	-
Capability Drop (CD) 1 - Information Sharing	MIPR	U.S. Army Future Command (AFC) : Picatinny Arsenal, NJ	2.795	2.704	Mar 2022	3.560	Nov 2022	2.000	Nov 2023	-		2.000	Continuing	Continuing	-
CD2 EPRM Engineering COA	C/TBD	TBD : TBD	0.000	0.000		1.500	Feb 2023	-		-		-	0.000	1.500	-
CD2 - Assessment Capability	MIPR	USAF : Washington, DC	0.500	0.272	Mar 2022	1.600	Feb 2023	2.000	Feb 2024	-		2.000	Continuing	Continuing	-
CD3 - Existing System Upgrades	MIPR	Naval Surface Warfare Center (NSWC) : Dahlgren	0.640	0.770	Jul 2022	0.700	Feb 2023	0.900	Feb 2024	-		0.900	Continuing	Continuing	-
CD3 - Existing System Upgrades	MIPR	USSTRATCOM : Omaha, NE	0.250	0.190	Feb 2022	0.250	Dec 2022	0.500	Dec 2023	-		0.500	Continuing	Continuing	-
CD4 - Workspace/Viewer on Secret Internet Protocol Router Network (SIPR)	C/CPFF	Appddiction, Inc. : Fort Belvoir, VA	0.420	0.805	May 2022	0.900	Apr 2023	0.500	Apr 2024	-		0.500	Continuing	Continuing	-
CD5 - Workspace/ Viewer on Joint Worldwide Intelligence Communications System (JWICS)	C/CPFF	Appddiction, Inc. : Fort Belvoir, VA	0.420	0.000		0.900	Apr 2023	0.500	Apr 2024	-		0.500	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*	**Project (Number/Name)** MA / *Mission Assurance Risk Management System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CD6 - Cross Domain Solution SIPR to JWICS	C/CPFF	Amazon Web Services : Seattle, WA	0.350	0.047	Aug 2022	0.100	Feb 2023	-		-		-	0.000	0.497	-
CD7 - CD6 - Cross Domain Solution JWICS to SIPR	MIPR	U.S. Army Future Command (AFC) : Picatinny Arsenal, NJ	0.125	0.000		0.000		0.500	Jan 2024	-		0.500	Continuing	Continuing	-
CD8 - Registry & Workspace/Viewer on Unclassified Internet Protocol Router Network (NIPR)	MIPR	U.S. Army Future Command (AFC) : Picatinny Arsenal, NJ	0.000	0.000		2.000	Apr 2023	0.441	Apr 2024	-		0.441	Continuing	Continuing	-
CD9 - Unclassified Data Management & Cross Domain Solution NIPR to Higher Domains	MIPR	U.S. Army Future Command (AFC) : Picatinny Arsenal, NJ	0.000	0.000		1.000	Apr 2023	0.500	Apr 2024	-		0.500	Continuing	Continuing	-
		Subtotal	5.500	4.914		13.440		8.816		-		8.816	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office Subject Matter Expertise Support	FFRDC	Institute for Defense Analysis : Ft. Belvoir, VA	0.000	0.250	May 2022	0.390	Nov 2022	0.250	Nov 2023	-		0.250	Continuing	Continuing	-
Program Management Office Subject Matter Expertise Support	IA	GSA FEDSIM : Ft. Belvoir, VA	0.000	0.192	May 2022	0.263	May 2023	0.250	May 2024	-		0.250	Continuing	Continuing	-
		Subtotal	0.000	0.442		0.653		0.500		-		0.500	Continuing	Continuing	N/A

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.500	5.356		14.093		9.316		-		9.316	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*	Project (Number/Name) MA / *Mission Assurance Risk Management System*	

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*	**Project (Number/Name)** MA / *Mission Assurance Risk Management System*

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Mission Assurance and Risk Management (MARMS)																												
Hosting for MARMS (Consolidated)																												
Capability Drop (CD) 1: Information Sharing Registry																												
CD 2: Assessment Capability – Enterprise Protection Risk Management System (EPRM) (to include new engineering task)																												
CD 3: System Upgrades – Mission Decomposition and Asset Dependency Module –Mission Assurance Decision Support System (MADSS)																												
CD 3: System Upgrades - Asset Management Module – Strategic Mission Assurance Database System (SMADS)																												
CD 4: Workspace/Viewer on SIPR																												
CD 5: Workspace/Viewer on JWICS																												
CD 6: Cross Domain Solution - SIPR to JWICS																												
CD 7: Cross Domain Solution - JWICS to SIPR																												
CD 8: Registry & Workspace/Viewer on NIPR																												
CD 9: Unclassified Data Management & Cross Domain Solution NIPR to Higher Domains																												
PMO SME Support																												

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*	**Project (Number/Name)** MA / *Mission Assurance Risk Management System*

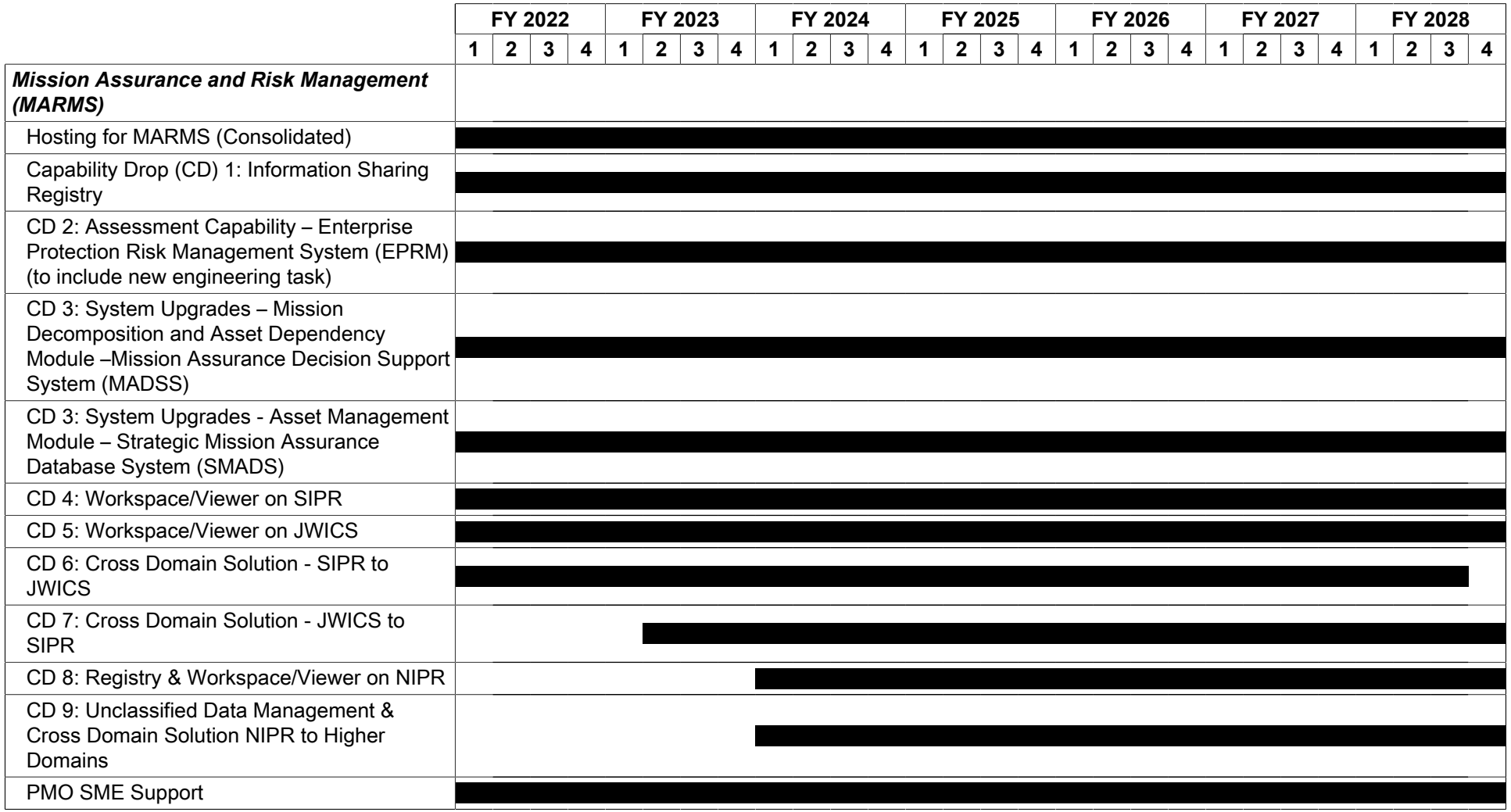


Exhibit R-4A, RDT&E Schedule Details: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605141BR / *MISSION ASSURANCE RISK MANAGEMENT SYSTEM (MARMS)*	**Project (Number/Name)** MA / *Mission Assurance Risk Management System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Mission Assurance and Risk Management (MARMS)				
Hosting for MARMS (Consolidated)	1	2022	4	2028
Capability Drop (CD) 1: Information Sharing Registry	1	2021	4	2028
CD 2: Assessment Capability – Enterprise Protection Risk Management System (EPRM) (to include new engineering task)	1	2021	4	2028
CD 3: System Upgrades – Mission Decomposition and Asset Dependency Module – Mission Assurance Decision Support System (MADSS)	1	2021	4	2028
CD 3: System Upgrades - Asset Management Module – Strategic Mission Assurance Database System (SMADS)	1	2021	4	2028
CD 4: Workspace/Viewer on SIPR	1	2021	4	2028
CD 5: Workspace/Viewer on JWICS	1	2021	4	2028
CD 6: Cross Domain Solution - SIPR to JWICS	1	2021	3	2028
CD 7: Cross Domain Solution - JWICS to SIPR	2	2023	4	2028
CD 8: Registry & Workspace/Viewer on NIPR	1	2024	4	2028
CD 9: Unclassified Data Management & Cross Domain Solution NIPR to Higher Domains	1	2024	4	2028
PMO SME Support	1	2022	4	2028

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605502BR / *SMALL BUSINESS INNOVATION RESEARCH*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	109.737	16.870	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing
RA: *Information Sciences and Applications*	109.737	16.870	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing

Note

Funding for the SBIR Program is consolidated in this program element during the year of execution. SBIR/STTR program funding was executed in Budget Activity 6 and, therefore, does not require an R-3 or an R-4.

A. Mission Description and Budget Item Justification

The Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs provide the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting the Department of Defense (DoD) research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of the DoD supported research and development results. These efforts are responsive to Public Law 106-554.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	16.870	0.000	0.000	-	0.000
Total Adjustments	16.870	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	16.870	-			

Change Summary Explanation

Funding for the SBIR program is consolidated in this program element during the year of execution.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605502BR / *SMALL BUSINESS INNOVATION RESEARCH*	Project (Number/Name) RA / *Information Sciences and Applications*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
RA: *Information Sciences and Applications*	109.737	16.870	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding is not allocated until the year-of-execution. Program Element 0605502BR “Small Business Innovation Research (SBIR)” is used to report year-end execution. FY 2023 and FY 2024 Plans are provided based on estimated SBIR/STTR funding levels to be determined in accordance with the law and relative to final Agency RDT&E portfolio appropriations.

A. Mission Description and Budget Item Justification

The Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs provide the means for stimulating technological innovation in the private sector and strengthens the role of small business in meeting the Department of Defense (DoD) research and development needs. These programs foster and encourage participation of minority and disadvantaged businesses in technological innovation and increase the commercial application of DoD supported research and development results. These efforts are responsive to Public Law 106-554 and the Small Business Act (15 U.S.C. 638).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: RA: Information Sciences and Applications	16.870	0.000	0.000
Description: This project provides the means for stimulating technological innovation in the private sector; strengthens the role of small business in meeting the DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of the DoD supported research and development results. These efforts are responsive to Public Law 106-554. ***FY 2023 Plans:*** Counter Weapons of Mass Destruction (CWMD) (approximately $16.591M). - Distributed, Cooperative, Learning for Subterranean Robotic Autonomous Systems project seeks the capability for its robotic systems to explore and exploit improved communication capabilities enabling systems to better operate in GPS denied and communications limited environments. - Global Nano Aerial Terrestrial Sensing (GNATS) project intends to develop and demonstrate an innovative robotic system showcasing a nano aerial vehicle (NAV) marsupial concept with a GPS-denied guidance capability to advance the state of Counter Weapons of Mass Destruction (C-WMD) missions.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605502BR / *SMALL BUSINESS INNOVATION RESEARCH*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Battlefield Radiation Detector project intends to develop an algorithm that can locally link radiation detectors (of different resolutions) to enhance identification and localization capability. Project goals include development of network hosted algorithms to link multiple and disparate battlefield RN detectors to enable the fusing and processing of raw detector outputs into usable information. - Framework for Application Lifecycle Management and Continuous Integration for High Performance Computing (HPC) architectures intends to develop a secure Application Lifecycle Management (ALM) and Continuous Integration / Continuous Delivery (CI/CD) framework for legacy codes. Such a capability would integrate existing tools into a cohesive framework to automate a series of steps such as test suites, ensuring code coverage of testing, version control, and streamlining of build process and bookkeeping of these steps/tests/versions. - Modernized Low Visibility RF Radio Capability project intends to develop a low visibility, jamming resistant, RF radio that is compatible with current CWMD sensors and operates on the Tactical Assault Kit (TAK) ecosystem. It will facilitate low-visibility CBRN Search Operations by the Technical Support Groups. ***FY 2024 Plans:*** Program efforts may include the following Counter Weapons of Mass Destruction (CWMD) projects. (approximately $17.380M). - Geiger–Müller Tube Alternative with Electronics project intends to develop and field an alternative to current Geiger–Müller tubes. The intent is to include an accompanying acquisition and analysis of electronics that will provide similar or enhanced detection capabilities while also allowing the instrument to operate in a high radiation environment without causing damage to the detector or the electronics. - Graphene and helix shaped steel fiber dosed concrete for electromagnetic pulse (EMP) and Blast Protection project plans to develop and demonstrate commercially viable building construction techniques with light-weight concrete, stay-in-place forms, and structural poured concrete both dosed with graphene and screw shaped steel microfibers to provide electrically conductive, thermally insulated, ultra-strong, blast, fire and EMP resistant buildings. - Perovskite Radiation Detectors and Imagers project plans to develop a portable, handheld, high-resolution, low operating voltage, spectroscopic-capable radiation detector using direct semiconductor radiation sensing elements that are based on perovskites. The detector could be carried by the warfighter or easily integrated into light vehicles to enable the operator to identify radioisotopes present in the battlefield or operational environment.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605502BR / *SMALL BUSINESS INNOVATION RESEARCH*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Subterranean Wireless Communications for Counter-WMD Missions project intends to further novel means to provide practical wireless communications which outperform traditional free-space radio frequency (RF) communications in subterranean environments during DoD CWMD missions. Efforts will explore methods to characterize technology performance in underground spaces, especially man-made underground facilities typical of those used for production, storage, and deployment of weapons of mass destruction (WMDs) then demonstrate the ability of the technology to be used for remote operation of multiple robotic systems in an environment typifying an underground facility used for WMD production, storage, or use. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	16.870	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 23/0602718BR: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	45.294	32.140	37.218	-	37.218	37.914	29.639	30.543	31.213	Continuing	Continuing
• 33/0603160BR: *COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*	76.268	78.991	86.415	-	86.415	90.571	88.687	89.660	92.136	Continuing	Continuing
• 105/0604551BR: *CATAPULT INFORMATION SYSTEM*	6.979	7.130	8.328	-	8.328	7.475	7.625	7.777	7.933	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605502BR / *SMALL BUSINESS INNOVATION RESEARCH*	**Project (Number/Name)** RA / *Information Sciences and Applications*

Remarks

N/A - SBIR/STTR program funding was executed in Budget Activity 6 and, therefore, does not require an R-3.

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605502BR / *SMALL BUSINESS INNOVATION RESEARCH*	**Project (Number/Name)** RA / *Information Sciences and Applications*

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A								[redacted]																				

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605502BR / *SMALL BUSINESS INNOVATION RESEARCH*	**Project (Number/Name)** RA / *Information Sciences and Applications*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
N/A	4	2023	3	2025

Note

N/A - SBIR/STTR program funding was executed in Budget Activity 6 and, therefore, does not require an R-4 or an R-4a.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0606853BR / *MANAGEMENT TECHNICAL AND INTERNATIONAL SUPPORT*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	10.295	11.919	-	11.919	12.115	12.358	12.605	12.857	Continuing	Continuing
MN: *Defense Critical Infrastructure - Mission Assurance*	0.000	0.000	10.295	11.919	-	11.919	12.115	12.358	12.605	12.857	Continuing	Continuing

Note

This program element supports the development of a series of advanced analytic efforts to more effectively identify risks and threats to Surge Layer Defense and, more broadly, DoD's Mission Assurance (MA) as identified in the current National Defense Strategy.

A. Mission Description and Budget Item Justification

The Defense Threat Reduction Agency (DTRA), as the DoD Center of Excellence for Mission Assurance Assessments, has been tasked by Deputy Assistant Secretary of Defense for Defense Continuity and Mission Assurance (DASD (DC&MA)) with leading change within the MA community on behalf of OSD to ensure best practices are documented during the Joint Mission Assurance Assessments (JMAA), Balanced Survivability Assessments (BSA), and Red Team Assessments. Including but not limited to dependency analysis, asymmetric threats, cyber operations, general engineering, security operations, and emergency management.

In partnership with the Critical Infrastructure Defense Analysis Center (CIDAC) and the U.S. Department of the Navy's Defense Critical Infrastructure - Mission Assurance program, DTRA's Mission Assurance program will perform mission analysis; engineering and commercial infrastructure network interdependency analysis; MA assessments; information enterprise design, implementation, and support; and defense industrial base supply chain network and related analysis. Providing broad leadership, best practices, research, development, coordination, and support to DoD Components around specific focus areas to drive solution-oriented efficiencies, collaboration, and results that benefit the entire DoD MA enterprise.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	12.354	11.919	-	11.919
Current President's Budget	0.000	10.295	11.919	-	11.919
Total Adjustments	0.000	-2.059	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.059			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0606853BR *I MANAGEMENT TECHNICAL AND INTERNATIONAL SUPPORT*

Change Summary Explanation

There is no change in FY 2024 from the previous President's Budget.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency			Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606853BR / *MANAGEMENT TECHNICAL AND INTERNATIONAL SUPPORT*	Project (Number/Name) MN / *Defense Critical Infrastructure - Mission Assurance*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MN: *Defense Critical Infrastructure - Mission Assurance*	0.000	0.000	10.295	11.919	-	11.919	12.115	12.358	12.605	12.857	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program element supports the development of a series of advanced analytic efforts to more effectively identify risks and threats to Surge Layer Defense and, more broadly, DoD's Mission Assurance (MA) as identified in the current National Defense Strategy.

A. Mission Description and Budget Item Justification

This project supports the development of a series of advanced analytic efforts to more effectively identify risks and threats to Surge-Layer Defense and, more broadly, DoD's Mission Assurance (MA) as identified in the current National Defense Strategy.

The Defense Threat Reduction Agency (DTRA) as the DoD Center of Excellence for Mission Assurance Assessments has been tasked by Deputy Assistant Secretary of Defense for Defense Continuity and Mission Assurance (DASD (DC&MA)) with leading change within the MA community on behalf of OSD to ensure best practices are documented during Joint Mission Assurance Assessments, Balanced Survivability Assessments, and Red Team Assessments. Including but not limited to dependency analysis, asymmetric threats, cyber operations, general engineering, security operations, and emergency management.

In partnership with the Critical Infrastructure Defense Analysis Center (CIDAC) and the U.S. Department of the Navy's Defense Critical Infrastructure - Mission Assurance program, DTRA's Mission Assurance program will perform mission analyses; engineering, and commercial infrastructure network interdependency analyses; MA assessments; information enterprise design, implementation, and support; and defense industrial base supply chain network and related analysis. Providing broad leadership, best practices, research, development, coordination, and support to DoD Components around specific focus areas to drive solution-oriented efficiencies, collaboration, and results that benefit the entire DoD MA enterprise.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: MN - Defense Critical Infrastructure - Mission Assurance	0.000	10.295	11.919
Description: This program establishes an integrated and comprehensive approach to deliver vastly improved threat data and operational support to the DoD mission assurance enterprise. ***FY 2023 Plans:*** - Provide oversight and program management of the Critical Infrastructure Defense Analysis Center (CIDAC) program in coordination with Office of the Under Secretary of Defense for Policy (OUSD(P)), the U.S. Navy, and the U.S. Air Force. - Provide HAAC products to facilitate DoD dependency analysis, vulnerability, and risk assessments.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency		Date: March 2023
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0606853BR / *MANAGEMENT TECHNICAL AND INTERNATIONAL SUPPORT*	**Project (Number/Name)** MN / *Defense Critical Infrastructure - Mission Assurance*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
- Develop innovative infrastructure network interdependency analysis while identifying and prioritizing threats and risks to DoD's critical infrastructure. ***FY 2024 Plans:*** - Provide oversight and program management of the CIDAC (formerly HAAC) program in coordination with the Office of the Under Secretary of Defense for Policy (OUSD(P)), the U.S. Navy, and the U.S. Air Force. - Provide CIDAC products to facilitate DoD dependency analysis, vulnerability, and risk assessments. - Develop innovative infrastructure network interdependency analysis while identifying and prioritizing threats and risks to DoD's critical infrastructure. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase from FY 2023 to FY 2024 is due to increased investment to progress in the development of innovative infrastructure network interdependency analysis while identifying and prioritizing threats.			
Accomplishments/Planned Programs Subtotals	0.000	10.295	11.919

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A