Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Defense Threat Reduction Agency	Date: March 2024
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603160BR *I COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	1,427.935	396.609	400.947	418.044	-	418.044	420.147	423.905	437.023	446.359	Continuing	Continuing
RA: *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	275.484	70.234	86.415	82.711	-	82.711	76.041	76.146	86.289	88.165	Continuing	Continuing
RD: *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	249.102	64.264	51.697	76.899	-	76.899	75.475	74.596	72.108	73.717	Continuing	Continuing
RG: *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	898.540	251.650	254.610	246.304	-	246.304	256.101	260.045	265.246	270.816	Continuing	Continuing
RR: *CWMD TEST AND EVALUATION*	4.809	10.461	8.225	12.130	-	12.130	12.530	13.118	13.380	13.661	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter Weapons of Mass Destruction (CWMD) Advanced Technology Development portfolio is aligned with National and Department of Defense (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 DoD, and the broader Weapons of Mass Destruction (WMD) threat reduction community.

The portfolio advances the 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; and (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 2025 Defense Threat Reduction Agency	Date: March 2024
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603160BR *I COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	406.721	400.947	411.296	-	411.296
Current President's Budget	396.609	400.947	418.044	-	418.044
Total Adjustments	-10.112	0.000	6.748	-	6.748
• 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	-10.112	0.000			
• Realignments	-	0.000	26.179	-	26.179
• Program Adjustment	-	-	-19.431	-	-19.431

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: RG: *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*		
Congressional Add: *Detection and Tracking Technology*	6.000	-
Congressional Add: *Advanced Manufacturing of Energetics*	5.000	-
Congressional Add Subtotals for Project: RG	11.000	-
Congressional Add Totals for all Projects	11.000	-

Change Summary Explanation

The increase from the previous President's Budget reflects a program adjustment in Projects RA, RG, and RR to fund higher Departmental priorities and the following realignments:

1) From Project RA in Program Element (PE) 0602718BR to Project RA in this PE for the CWMD Information Integration Cell (CIIC) for CWMD situational awareness,
2) From Project RD in PE 0602718BR to Project RD in this PE for the progression of nuclear survivability technologies to advanced technology development,
3) From Project RD in this PE to Project RD in PE 0605000BR to transition Nuclear, Chemical, Biological, Radiological, and high Explosive Analysis Toolsets (NATs) to the systems demonstration phase,
4) From this project to DTRA's Operation and Maintenance (O&M) account for technical reachback and other Departmental priorities,
5) From this project to DTRA's Procurement, Defense-Wide (P, DW) account to upgrade one radionuclide shelter to enhance the performance and sustainment of the International Monitoring System nuclear explosion monitoring capability, and

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Defense Threat Reduction Agency	Date: March 2024
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603160BR *I COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT*

6) From Project RR in PE 0603176BR to Project RA in this PE, to better integrate National Assessment Group activities into the RDT&E portfolio.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
RA: *CWMD CROSS-CUTTING TECHNICAL AND INFORMATION SCIENCES*	275.484	70.234	86.415	82.711	-	82.711	76.041	76.146	86.289	88.165	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Counter Weapons of Mass Destruction (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 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 2023	FY 2024	FY 2025
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	70.234	86.415	82.711
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 2024 Plans:*** - Provide 24/7 technical reachback assistance, decision support and planning support to Combatant Command (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.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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 2023	FY 2024	FY 2025
- 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 2025 Plans:*** - Provide 24/7 technical reachback assistance, decision support and planning support to Combatant Command (CCMD), Service, interagency and other government customers to support immediate mission and operational environments; respond to over 1300 requests for information/assistance with over 95% timeliness in responses. - Develop comprehensive capability for modeling atmospheric release and effects of chemical, biological, radiological, and nuclear (CBRN) material, incorporating the latest threat developments and trends into the Hazard Prediction and Assessment Capability (HPAC) model; develop multi-operating system containerized version to meet Security, Development, and Operations (SecDevOps) guidance and streamline integration and transition. - Rapidly prototype software applications and data science solutions to enhance CWMD situational awareness and information sharing, synchronization of operations, and identification of WMD threats. Maintain rotating portfolio in various stages of development, from initial concept through transition to advanced developer or to the customer for sustainment. - Develop data integration, analysis and visualization solutions in support of 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. - Deliver engineering /vulnerability studies identifying areas for continued capability development to support CCMD counter threats; develop/deliver rapid prototype CWMD and emerging threat capabilities addressing emerging theater CWMD requirements, with focus on: vulnerabilities analysis, human-machine interfaces, networked sensing and signatures, next generation communications, and disruptive technologies. - 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 under the DTRA Requirements Management Tool (DRMT) to capture, document, decompose, and prioritize DTRA RDT&E activities, including the identification and de-confliction of redundancies across DTRA, greater DoD and broader government CWMD capability development activities. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The decrease from FY 2024 to FY 2025 reflects the net impact of a program adjustment to cross-cutting technology development to fund higher priority Departmental requirements and the following realignments:			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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 2023	FY 2024	FY 2025
1) From Project RA in Program Element (PE) 0602718BR to this project for the CWMD Information Integration Cell (CIIC) to provide visualization, simulation, data analysis, and decision support capabilities for CWMD situational awareness, 2) From this project to Project RD in PE 0602718BR for CWMD modeling and simulation, 3) From this project to Project RD for increased investment in Over-the Horizon Arms Control (OTHAC) initiative efforts for radiation detection and test bed activities, 4) From this project to DTRA's Operation and Maintenance (O&M) account for technical reachback and other Departmental priorities, and 5) From this project to DTRA's Procurement, Defense-Wide (P, DW) account to upgrade one radionuclide shelter to enhance the performance and sustainment of the International Monitoring System nuclear explosion monitoring capability. .			
Accomplishments/Planned Programs Subtotals	70.234	86.415	82.711

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• BA2/24/0602718BR: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	29.047	37.218	21.986	0.000	21.986	22.538	26.949	23.627	24.113	Continuing	Continuing
• BA4/107/0604551BR: *CATAPULT*	6.953	8.328	7.475	0.000	7.475	7.625	7.777	7.933	8.100	Continuing	Continuing
• BA6/172/0605502BR: *SMALL BUSINESS INNOVATION RESEARCH*	16.591	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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 2025 Defense Threat Reduction Agency			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
RD: *NUCLEAR TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	249.102	64.264	51.697	76.899	-	76.899	75.475	74.596	72.108	73.717	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.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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*

Delivers integrated applications, data analysis, and cloud-ready artificial intelligence (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 2023	FY 2024	FY 2025
Title: RD: Nuclear Technologies and Capabilities Development	64.264	51.697	76.899
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 2024 Plans:*** - Develop Artificial Intelligence/Machine Learning (AI/ML) capability to ingest and analyze sensor feeds into DoD command and control (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 Combatant Command (CCMD) operation plans (OPLANs), course of action (COA) development, and concept of operations (CONOPs); leverage 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. - 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).			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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 2023	FY 2024	FY 2025
- 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 the Defense Threat Reduction Information Analysis Center (DTRIAC). ***FY 2025 Plans:*** - Deliver Mission Impacts of Nuclear Events (MINES) support of the analysis and assessment of Combatant Command (CCMD) operation plans (OPLANs), course of action (COA) development, and concept of operations (CONOPs) to support mission impacts of nuclear detonations in the ground, air, maritime & space domains. - Complete testing of machine-language tool for component identification and expand artifacts reference dataset for foreign equipment inspections to support arms control inspections, verifications, and authentications. - Complete 3-D models for topography effects on yield estimation and comparative data analysis for INDOPACOM areas of interest; complete xenon integration into a multi-function atom-trap trace analysis system and testing for potential International Monitoring System (IMS) integration. - Conduct space-based prompt diagnostics characterization preliminary design review (PDR) and develop plan for component ground testing to provide relevant forensic data supporting attribution in the event of a nuclear attack. Model and simulate improvements to detector response for prompt data collection to support U.S. Prompt Diagnostics System mission and deliver improved ground debris collection capabilities. - Demonstrate interdependent infrastructure models using water, petroleum, and transportation with coupling to a significant nuclear weapons effect environment and deliver 14 new integrated or updated capabilities through Nuclear Capabilities Services (NuCS) 2025 for strategic contingency planning and damage estimation efforts. - Deliver moving receiver radiation dose, eye damage/flash blindness, source-region EMP, and radiation hardness standard computation tool to U.S. Army via Enhanced Nuclear Weapons Effects Database (eNWEDS) for maneuver planning and NATO support. - Deliver MIL-STDs and handbooks that keep pace with threat, technology, and methodologies to ensure the warfighter has the tools necessary to develop a survivable strategic deterrent; provide Test and Evaluation (T&E) support for Phase 2 of the Comprehensive Endo-/Exo-Atmospheric Nuclear Environment Standard (CANES) revision.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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 2023	FY 2024	FY 2025
- 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. - Support end-user early operational assessments and transition activities to ensure radiation sensor prototype capabilities meet the minimum criteria to be inserted into a program-of-record or for direct procurement and develop an application programming interface to reduce time and cost of integration with Service and CCMD training tools. - Refresh Nuclear, Chemical, Biological, Radiological, and high-Explosive (NCBRE) Analysis Toolset (NATs) Consequence Assessment user interface and integrate latest Linux version of the Hazard Prediction and Assessment Capability (HPAC) to improve system performance; deliver updates to Comprehensive Nuclear Effects Model providing one canvas for all available nuclear effects calculations for CCMDs, Services, and DTRA Technical Reachback. - Enhance the historical nuclear testing archive at Defense Threat Reduction Information Analysis Center (DTRIAC). - Deliver verified water shock environment tool to U.S. Army and Nuclear Capabilities Services (NuCS) Team for seaport damage to support U.S. Army planners' operations for nuclear environments. - Publish two updated nuclear weapons effects chapters for the Nuclear Weapons Effects Manual One (EM-1). - Enhance the historical nuclear testing archive at the Defense Threat Reduction Information Analysis Center (DTRIAC), - Modernize the Defense Stockpile Management System (DSMS). ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase from FY 2024 to FY 2025 reflects the net impact of realignments: 1) From Project RA in this PE and O&M to this project for Over the Horizon Arms Control (OTHAC) initiative efforts for radiation detection and test bed activities, 2) From Project RD in PE 0602718BR to this project for the transition of nuclear survivability activities into advanced technology development efforts in the areas of electro-magnetic pulse hardening, verification technologies, X-ray simulators, and response validation, 3) From this project to Project RD in PE 0605000BR for the transition of Nuclear, Chemical, Biological, Radiological, and high Explosive Analysis toolsets to the systems demonstration phase and to the Operation and Maintenance (O&M) account for operations.			
Accomplishments/Planned Programs Subtotals	64.264	51.697	76.899

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• BA2/24/0602718BR: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	109.737	119.670	106.576	0.000	106.576	107.899	107.340	109.484	111.675	Continuing	Continuing
• BA5/139/0605000BR: *COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT*	14.044	14.414	14.841	0.000	14.841	15.069	17.522	17.860	18.323	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 2025 Defense Threat Reduction Agency											Date: March 2024	
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 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
RG: *CWMD TECHNOLOGIES AND CAPABILITIES DEVELOPMENT*	898.540	251.650	254.610	246.304	-	246.304	256.101	260.045	265.246	270.816	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Counter Weapons of Mass Destruction (CWMD) 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 counter Weapons of Mass Destruction (WMD) while mitigating collateral contamination effects.

Enable rapid capability delivery supports urgent warfighter operational requirements in countering Weapons of Mass Destruction (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; 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 2023	FY 2024	FY 2025
Title: RG: CWMD Technologies and Capabilities Development	240.650	254.610	246.304
Description: Project RG develops advanced technologies and weapon concepts and validates their applicability to CWMD. ***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.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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 2023	FY 2024	FY 2025
- Deliver Targeting Weaponeering Assistance Cell (TWAC) targeting recommendation packages and conduct training activities as requested by Combatant Commands.			
FY 2025 Plans:			
- Demonstrate electromagnetic pulse (directed energy) effects capabilities in a developed prototype on a relevant WMD hardened structure as prioritized by end users.			
- Develop additional full-scale WMD manufacturing facility target model to test multiple agent and facility defeat capabilities.			
- Optimize rubble generation in support of active denial of adversary's use of hardened and deeply buried targets (HDBTs).			
- Develop and deliver high density high explosive materials to hold high value HDBT at risk.			
- Spiral develop unmanned kinetic weapon system for precision defeat of WMD platforms and infrastructure to deter WMD aggression in USINDOPACOM.			
- Test special purpose kinetics and other precision effects improved by additive manufacturing processes.			
- Test prototype that determines presence of WMD materials behind barriers to identify current and emerging WMD threats against combat forces in USINDOPACOM.			
- Test capability to bypass WMD mechanical security to support efforts to increase situational awareness of adversarial WMD activities in USINDOPACOM.			
- Conduct functional utility test of universal decoding prototypes for operational utility against USINDOPACOM threats.			
- Provide offensive, scalable, and flexible options for execution of overt and discreet Counter Proliferation (CP) & CWMD operations to deny, delay, degrade, disrupt, defeat, or destroy facilities, critical nodes, and other WMD capabilities in support of USSOCOM and other CCMDs.			
- Development and transition of Kinetic Barrier Defeat Tools, Maritime System Defeat Tools, and Critical Node Defeat Tools for CCMD use.			
- Development of WMD Facility Defeat operational support technologies for CCMD use.			
- Transition next generation (NextGen) 6G/ & "Next G" Radio Frequency (RF) threat countermeasures capability to USSOCOM, CCMDs, and other US government partners.			
- Provide diagnostic and defeat tools against emergent CWMD requirements for specific Explosive Ordnance Disposal (EOD) render safe operations.			
- Deliver capability integrating tools to create and modify buildings in a computer-based simulation/model to share targeting data with other targeting systems seamlessly; implement capability for cloud computing to accelerate targeting processing.			
- Release Integrated Munitions Effect Assessment (IMEA) V13.0 in new, modular architecture that enables greater sharing with key allies, cloud computing and supports seamless interoperability with targeting community.			
- Develop and integrate baseline mobile missile launcher models with WMD capabilities into IMEA to support rapid targeting and weapons effects predictions for pacing and acute threats.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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 2023	FY 2024	FY 2025
- Integrate modules to simulate combined kinetic and non-kinetic (direct energy/cyber) effects. - Integrate hypersonic system characterization and weapons data in models to allow for dynamic targeting of WMD targets including delivery systems. - Integrate dynamic weapon capabilities (penetration, fracturing) for adversarial weapons systems into Vulnerability Assessment and Protection Option (VAPO). - Move VAPO to net-centric cloud-based solution, enabling broader accessibility to multiple user communities and allowing for faster delivery time on capability enhancements for improved bug fix capability and version control, enhanced security, and better control over user access and experience. - Provide Targeting Weaponeering Assistance Cell (TWAC) weaponeering Subject Matter Experts (SME) to deliver ~500 (estimated) Targeting Recommendation Packages and participate in Targeting Planning Conferences in support of USINDOPACOM and USEUCOM. - Support weapon development and weapon effects phenomenology programs such as the Legacy Weapons Test Program (LWTP) with test design, requirements, and execution support ensuring operational requirements are met and validated models are integrated into weaponeering planning tools. - Mature Full Dimensional Defeat Enterprise (FDDE) organization and functionality featuring workshops, demonstrations and CCMD exercise support. - Enhance FFDE agent-based modeling approach to system of systems analysis of WMD targets, expanding functional agent libraries and facility templates, including larger system of facilities and cross-domain targeting. - Fully integrate Automated Advanced Target Development (A2TD) capability to produce automated Underground Targeting and Assessment System (UTAS) models on selected target sets to include automated procedures for feature extraction of observables, automated geology characterization, using Defense Intelligence Agency (DIA) Underground Facility Analysis Center (UFAC) approved layouts. - Coordinate with and receive certification from National Geospatial Intelligence Agency (NGA) for point positioning capability to allow direct aim point determination without the requirement for separate geo-recertification of the point in a separate system. - Initiate WMD Target Immersive Mission Planning (TIMP) project to leverage target models built through A2TD and FDDE to create a 3-D immersive virtual reality environment for iterative mission planning. - Develop Nuclear-Automated Advanced Target Development (N-A2TD) prototype ready for Verification and Validation (V&V) which provides more realistic target input parameters by incorporating existing state of the art 3-D UFAC DIA models for the basis of calculation.			
FY 2024 to FY 2025 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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 2023	FY 2024	FY 2025
The decrease from FY 2024 to FY 2025 is due to decreased investment in CWMD hard target defeat, rapid capability delivery, counter emergent threat technologies, and CWMD target assessment technologies to fund higher priority Departmental requirements.			
Accomplishments/Planned Programs Subtotals	240.650	254.610	246.304

	FY 2023	FY 2024
Congressional Add: Detection and Tracking Technology ***FY 2023 Accomplishments:*** - Developed 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.	6.000	-
Congressional Add: Advanced Manufacturing of Energetics ***FY 2023 Accomplishments:*** - Designed and developed 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.	5.000	-
Congressional Adds Subtotals	11.000	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• BA2/24/0602718BR: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	30.311	30.871	28.193	-	28.193	29.028	31.788	32.423	33.104	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 2025 Defense Threat Reduction Agency			Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
RR: *CWMD TEST AND EVALUATION*	4.809	10.461	8.225	12.130	-	12.130	12.530	13.118	13.380	13.661	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Countering Weapons of Mass Destruction (CWMD) Test and Evaluation project provides a unique national test capability for simulated WMD facilities and processes. This capability provides DTRA's 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 2023	FY 2024	FY 2025
Title: RR: CWMD Test and Evaluation	10.461	8.225	12.130
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 2024 Plans: - Develop intuitive, visual browser access to data and improve reliability of infrastructure services for assembly of large data sets for Artificial Intelligence/Machine Learning (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 2025 Plans: - Finalize Data and Management Handling capability to manage two PetaBytes of historic test data and 200 TeraBytes per year of future data is archived and accessible in compliance with DoD Scientific and Technical Information Program. - Develop new data analysis and visualization tools. Expand access to various networks. - Instrument test ranges and conduct 100 individual test events in support of RDT&E programs. - Replace 20% of instrumentation and data acquisition equipment in accordance with 5-year life cycle management plan.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency		Date: March 2024
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
- Develop and replace obsolete and end of life data acquisition systems to ensure state-of-the-art testing capability for DTRA. - Enhance optics capabilities to enable testing at multiple locations simultaneously. - Provide test range support and DTRA facility support at Nevada National Security Site to enable end-to-end testing for four national-level CWMD tests (customers are expected to include 14 DoD and other USG Agencies). - Perform repairs and remediation of 1,000 feet of the DTRA-owned, deeply-buried underground tunnel test complex at Capitol Peak on White Sands Missile Range. - Develop, refine, and upgrade existing modeling and simulation tools, most notably the Tunnel Air Blast (TAB) model that incorporates the effects of debris on the resulting air blast in the tunnel, leading to a greatly improved capability to forecast air blast pressures resulting from in-tunnel detonations. - Integrate the results of the geotechnical characterization, the Z-model for penetration prediction, and geostatistical analysis into a fast-running tool that will provide accurate penetration predictions for selecting aim points and scoping penetration tests at the New Granite site. Includes 3D Rockworks model for visualization of site geologic variability. - Conduct 30 classified, independent operational assessments of new/novel kit/capabilities for Combatant Commands. - Produce 35 letters of observation and final reports. - Provide technical, instrumentation, and communications end-items and bench stock required to ensure the test division remains full mission capability, relevant to emerging test requirements, and updates items in accordance with service life plan. - Purchase various Radio-frequency equipment to update stock of cabling, omni-directional antennas, and measurement systems. - Purchase various monitoring and analysis tools to support susceptibility, new tool, and network effects assessments. - Purchase Electronic Warfare/Electronic Surveillance and general Radio-frequency collection, analysis, testing and measurements training for relevant capabilities to expand into the growing testing and evaluation support realm as services acquire more capabilities to execute in the mission space. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase from FY 2024 to FY 2025 reflects the net impact of 1) the realignment of the National Assessment Group from Project RR in PE 0603176BR to this project to better integrate this activity administratively into the RDT&E portfolio, and 2) decreased investment in testbed recapitalization, test diagnostics, and the National Assessment Group test assessments to fund higher priority Departmental requirements.			
Accomplishments/Planned Programs Subtotals	10.461	8.225	12.130

Exhibit R-2A, RDT&E Project Justification: PB 2025 Defense Threat Reduction Agency			Date: March 2024
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*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• BA2/24/0602718BR: *COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH*	17.718	21.111	18.200	-	18.200	20.939	19.786	20.210	20.663	Continuing	Continuing
• BA3/36/0603176BR/RR: *ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT*	6.343	7.990	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.495

Remarks

D. Acquisition Strategy

N/A