Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency											Date: March 2019	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	1,957.505	292.846	280.858	340.065	-	340.065	333.624	336.004	344.360	349.004	Continuing	Continuing
RA: **CWMD Cross-Cutting Technical and Information Sciences*	51.128	17.732	11.286	34.825	-	34.825	30.722	32.739	35.660	37.254	Continuing	Continuing
RD: ***Nuclear Technologies and Capabilities Development*	43.023	21.923	26.021	70.153	-	70.153	64.234	60.840	62.070	61.168	Continuing	Continuing
RE: *Counter-Terrorism Technologies*	757.112	101.737	108.978	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	967.827
RF: *Forensics Technologies*	433.928	25.535	33.578	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.041
RG: ****Counter WMD Technologies and Capabilities Development*	134.888	40.688	20.277	235.087	-	235.087	238.668	242.425	246.630	250.582	Continuing	Continuing
RI: *Nuclear Survivability*	50.493	7.289	5.783	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	63.565
RL: *Nuclear & Radiological Effects*	3.390	8.505	3.427	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.322
RM: *WMD Counterforce Technologies*	173.550	23.667	25.243	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	222.460
RR: *CWMD Test and Evaluation*	16.052	0.000	12.394	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.446
RT: *Target Assessment Technologies*	293.941	45.770	33.871	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	373.582

Note

In program element 0603160BR, Defense Threat Reduction Agency's (DTRA) consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. Additionally, DTRA consolidated projects RE-Counter-Terrorism Technologies, RM-WMD Counterforce Technologies, RR-CWMD Test and Evaluation, and RT-Target Assessment Technologies, into the renamed project RG-Counter WMD Technologies and Capabilities Development.

*Project RA title changes from Information Sciences and Applications to CWMD Cross-Cutting Technical and Information Sciences in FY 2020.
**Project RD title changes from Detection Technologies to Nuclear Technologies and Capabilities Development in FY 2020.
***Project RG title changes from Defeat Technologies to Counter WMD Technologies and Capabilities Development in FY 2020.

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

A. Mission Description and Budget Item Justification

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

The portfolio advances the Countering Weapons of Mass Destruction (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.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	268.607	299.858	278.093	-	278.093
Current President's Budget	292.846	280.858	340.065	-	340.065
Total Adjustments	24.239	-19.000	61.972	-	61.972
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-29.000			
• Congressional Rescissions	-	-			
• Congressional Adds	30.000	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.761	-			
• Realignments	-	-	61.972	-	61.972

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: RG: ****Counter WMD Technologies and Capabilities Development*		
Congressional Add: *Target Sensing Technologies*	10.000	10.000
Congressional Add Subtotals for Project: RG	10.000	10.000
Congressional Add Totals for all Projects	10.000	10.000

Change Summary Explanation

The increase in FY 2020 from the previous President's Budget submission is due to increased investment for the improvement of technical reachback capacity to grow operational support as current demand outpaces capacity, quick reaction capabilities to rapidly transition both material and non-material solutions to

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

the field, increased investment in the development of classified and unclassified United States Central Command (USCENTCOM) and United States Special Operations Command (USSOCOM) efforts to counter threat networks by assessing, identifying, and providing capabilities to maintain technological superiority, the development of technological applications to operate in a nuclear contaminated environment, and development of battlefield tools necessary to support time-sensitive decision-making during nuclear warfare. There is 20% real growth in this program element from the previous President's Budget submission.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RA: *CWMD Cross-Cutting Technical and Information Sciences	51.128	17.732	11.286	34.825	-	34.825	30.722	32.739	35.660	37.254	Continuing	Continuing

Note

*Project RA title changes from Information Sciences and Applications to CWMD Cross-Cutting Technical and Information Sciences in FY 2020.

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, and leverages research performed by the Project on Advanced Systems and Concepts for CWMD at the Naval Postgraduate School. The project also supports international CWMD cooperation by developing technologies and concepts suitable for foreign release.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	17.732	11.286	34.825
Description: Project RA develops modeling and simulation capabilities and provides technical reachback support to maintain and increase decision advantage for the United States and its allies through improved situational understanding across the complete CWMD mission space. ***FY 2019 Plans:*** - Continue to provide tailored support to DoD with 24/7 technical reachback via processes, capabilities, and expertise in CBRNE. Leverage this support for partner stakeholders, providing scientific modeling support to Department of Health and Human Services and serving as the Federal Emergency Management Agency's Interagency Modeling and Atmospheric Assessment Center (IMAAC) Technical Operations Hub. - Research and develop capabilities to predict/simulate Higher Order Effects, including spread of infectious disease and protection from WMD, and other required capabilities to support U.S. Strategic Command (USSTRATCOM). ***FY 2020 Plans:*** - Develop a robust quick reaction to rapidly transition both material and non-material developmental technologies to fielded solutions. Develop acquisition expertise, innovation tools, and agile contract solutions to more effectively deliver capabilities to the warfighter as urgent operational requirements emerge.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 2018	FY 2019	FY 2020
- Continue to provide tailored support to DoD with Technical Reachback via processes, capabilities, and expertise in WMD and explosives modeling and simulation. Leverage this support for partner stakeholders, providing scientific modeling support to Department of Health and Human Services and serving as the Federal Emergency Management Agency's IMAAC Technical Operations Hub. - Continue to develop capabilities in support of USSTRATCOM and United States Northern Command (USNORTHCOM) that predict and simulate Higher Order Effects, including the spread of infectious diseases, WMD protection measures, DoD response efforts, and force health protection measures. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase from FY 2019 to FY 2020 is due to increased investment for the improvement of technical reachback capacity to grow operational support in technical reachback as current demand outpaces capacity. This is a critical resource that provides 24/7 support to CCMDs, fulfilling direct warfighter requests. Additionally, increased investment supports the quick reaction capability to rapidly transition both material and non-material developmental capabilities to fielded solutions, enhancing DTRA's ability to meet emergent needs that require short order response by providing the acquisition innovation tools, operational and acquisition experts, and flexible contract solutions designed to speed capability to the warfighter.			
Accomplishments/Planned Programs Subtotals	17.732	11.286	34.825

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RA: *Counter Weapons of Mass Destruction Applied Research*	40.189	30.603	46.317	-	46.317	48.032	49.312	49.896	58.703	Continuing	Continuing
• 105/0604775BR/RA: *Advanced Component Development and Prototypes*	0.000	0.000	14.021	0.000	14.021	12.564	6.800	6.800	6.700	Continuing	Continuing
• 159/0605502BR/RA: *Small Business Innovation Research*	11.311	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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*

E. Performance Metrics

Number of successful assessments resulting from technical reachback responses. Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RD: ***Nuclear Technologies and Capabilities Development*	43.023	21.923	26.021	70.153	-	70.153	64.234	60.840	62.070	61.168	Continuing	Continuing

Note

In program element 0603160BR, Defense Threat Reduction Agency's (DTRA) consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. There is zero real growth in this project.

**Project RD title changes from Detection Technologies to Nuclear Technologies and Capabilities Development in FY 2020.

A. Mission Description and Budget Item Justification

1. Research, development, test, and evaluation 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 DoD requirements for countering terrorism, counterproliferation, nonproliferation, countering rogue states, and homeland defense.

2. Research, development, test, and evaluation (RDT&E) to systematically study signatures associated with adversary nuclear programs and nuclear detonations gain knowledge or understanding necessary to determine technical capabilities needed to improve Department of Defense (DoD) contingency planning activities; gain knowledge or understanding necessary to improve DoD situational awareness on the nuclear battlefield; gain knowledge or understanding necessary to improve capabilities to attribute the source of a nuclear.

3. 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 Department of Defense 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 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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*

4. 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 2018	FY 2019	FY 2020
Title: RD: Nuclear Technologies and Capabilities Development	21.923	26.021	70.153

Description: Project RD develops, integrates and transitions radiation detection technologies, as well as 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 2019 Plans:
- Test the Modular Airborne Gaseous Isotope Collection System (MAGICS) gas collection system in the field in support of closer, sooner, site-specific monitoring. Novel technologies are necessary to conduct gas monitoring in support of nuclear detection missions, as timing, signature strength and complex analysis present challenges.
- Develop unattended sensor networks for autonomous detection and analysis.
- Catalog relevant seismic signatures, and develop algorithms for signature detection.
- Continue to conduct targeted research on component-level technologies, such as low-power electronics, solid-state photodetectors, search and ID algorithms, and helium-3 replacement technologies, which will improve existing detection technology subsystem components.
- Develop and integrate nuclear and radiological signature collections into new sensor systems.
- Further the development of nuclear threat analysis algorithms to be implemented in existing systems in order to increase accuracy and reduce processing time.
- Demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas.
- Improve the setup, maintenance, and peer-to-peer collaboration provided by systems shared among nuclear and radiological search teams.
- Test and evaluate new radiation detection technologies in order to validate capabilities, improve prototypes, and provide required performance data to support follow-on development.
- Improve capabilities to effectively monitor and control networked systems of sensors, and expand the use of augmented reality to increase situational awareness.
- Improve low-visibility, high-precision gamma spectroscopy, particularly for indoor or concealed operation.
- Develop and integrate nuclear and radiological signature collections into new sensor systems.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 2018	FY 2019	FY 2020
- Further the development of nuclear threat analysis algorithms to be implemented in existing systems in order to increase accuracy and reduce processing time. - Demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas. - Improve the setup, maintenance, and peer-to-peer collaboration provided by systems shared among nuclear and radiological search teams. - Test and evaluate new radiation detection technologies in order to validate capabilities, improve prototypes, and provide required performance data to support follow-on development. - Develop new capabilities to emplace detectors into previously denied areas. - Improve capabilities to effectively monitor and control networked systems of sensors, and expand the use of augmented reality to increase situational awareness.			
FY 2020 Plans: - Improve DoD decision-making by adapting, integrating, and conducting field test of nuclear sensor capabilities to quickly characterize nuclear events (e.g. tests, explosions on the battlefield) in order to inform tactical, operational, and strategic military action. - Develop and test techniques to improve the ability of nuclear modeling codes to support tactical DoD operations. - Develop and improve nuclear technologies for application to DoD, international, and other government agency missions. - Develop, integrate and field test technologies and techniques for “field analysis of nuclear event to provide rapid answers in support of nuclear threat, attribution processes, and counterproliferation activities, and improved situational awareness on the nuclear battlefield in order to inform tactical and strategic military action. - Continue to test and develop MAGICS gas collection system in the field in support of closer, sooner, site-specific monitoring. Novel technologies are necessary to conduct gas monitoring in support of nuclear detection missions, as timing, signature strength and complex analysis present challenges. - Continue to develop unattended sensor networks for autonomous detection and analysis. - Continue to conduct targeted research on component-level technologies, such as low-power electronics, solid-state photodetectors, search and ID algorithms, and helium-3 replacement technologies, which will improve existing detection technology subsystem components. - Continue to develop, demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 2018	FY 2019	FY 2020
- Continue to lead a DoD and interagency, end-to-end nuclear technology demonstration and evaluation of DTRA-developed technologies/methodologies to assess NTNF process improvements and identify potential capability gaps in confidence, timeliness, and accuracy, and assist in assessing contribution to interagency attribution process and decisions. - Continue to develop new or update existing standards and handbooks to capture critical information for DoD to verify and validate mission critical systems. - Continue to develop and collaborate on Satellite System Natural and Nuclear Environment Protection Standard with DoD Stakeholders and the DoD Standardization Program Office. - Continue producing technical reports addressing DoD radiogenic disease concerns; which address Congressional interest in historical veteran radiation exposure and present day radiological exposures of the DoD-affiliated population. - Continue to maintain Defense Integration and Management of Nuclear Data Services (DIAMONDS) while developing DIAMONDS Next Generation testing for functional and data validation. Maintain current reporting on both systems to allow for data verification and validation in preparation for initial operating capability release. - Continue to develop natural gas and water/seawater effects models in support of USSTRATCOM Consequences of Execution efforts, linking higher order effects to PMESII analyses. - Continue to integrate, demonstrate, and deliver a suite of consistent and enhanced models, tools, references, and data to US and Allied nuclear weapon effects stakeholders. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase from FY 2019 to FY 2020 is due to the realignment of Projects RF-Forensics Technology, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles. Real growth in this project is zero.			
Accomplishments/Planned Programs Subtotals	21.923	26.021	70.153

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RD: *Counter Weapons of Mass Destruction Applied Research*	13.745	16.860	92.710	-	92.710	93.612	95.541	97.485	99.433	Continuing	Continuing
• 127/0605000BR/RD: **Counter Weapons of Mass Destruction Systems Development*	-	-	7.500	-	7.500	7.650	7.803	7.959	8.118	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development*	Project (Number/Name) RE / *Counter-Terrorism Technologies*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RE: *Counter-Terrorism Technologies*	757.112	101.737	108.978	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	967.827

Note

Beginning in FY 2020, efforts in this project are captured under project RG-Counter WMD Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

The Counter-Terrorism Technologies project develops and transitions a full spectrum of new technologies to counter emergent weapons of mass destruction (WMD) threats. This project supports the U.S. Special Operations Command (USSOCOM) in two research areas: (1) Countering WMD-Terrorism (CWMD-T) Counterproliferation Research and Development is a collaborative effort to develop advanced, warfighter-unique technologies to defeat terrorist WMD development/ acquisition pathways, to include defeat of the devices themselves, while minimizing risks to U.S. forces; (2) USSOCOM CWMD-T Support develops concepts and technologies to integrate and synchronize operations and activities that prevent terrorists 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RE: Counter-Terrorism Technologies	101.737	108.978	-
Description: Project RE supports Joint U.S. Military Forces, specifically USSOCOM, in the research areas of warfighter-unique, mission-specific WMD defeat, denial, counterproliferation, and interdiction technologies. ***FY 2019 Plans:*** - Continue to develop offensive counterproliferation, counter-WMD technologies in support of combatant command requirements. - Continue development of WMD and pathway defeat technologies, as well as threat-specific test articles and analyses necessary to support the modeling archive used to support such developmental efforts. - Continue to develop lighter, smaller, more effective breaching capabilities. - Continue to develop next generation WMD detection technology applications. - Deploy Analyzer for Wide-Area Restoration Effectiveness (AWARE) V1.0 in Dynamic Picture of the Operating Environment (DPOE) 4.0, the next generation of DPOE that will incorporate research advances in High Performance Computing (HPC), analytics, and natural language processing. AWARE v1.0 will improve users' ability to identify emerging threat entities with existing personnel resources and reduce missed opportunities.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RE / *Counter-Terrorism Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Integrate HPC software tools into DPOE, leveraging capabilities of high performance computing to improve automated analytics to more accurately or quickly identify events, actors and threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The decrease from FY 2019 to FY 2020 is due to the realignment of Project RE-Counter-Terrorism Technologies into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	101.737	108.978	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RE: *Counter Weapons of Mass Destruction Applied Research*	0.693	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

Prior year funds are related to this project in program element 0602718BR.

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development*	Project (Number/Name) RF / *Forensics Technologies*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RF: *Forensics Technologies*	433.928	25.535	33.578	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.041

Note

Beginning in FY 2020, efforts in this project are captured under project RD-Nuclear Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

The Forensics Technologies project develops, integrates, tests, and demonstrates post-detonation nuclear forensics systems providing accurate, rapid, and reliable means to collect, analyze, and evaluate prompt data and debris from a nuclear or radiological event in support of exploitation and attribution efforts. These forensic capabilities enable the Defense Threat Reduction Agency (DTRA) and its trusted partners to detect, locate, identify, track, and interdict nuclear and radiological threats, including weapons and material, and enablers to their acquisition and development. In accordance with DoD Directive S-2060.04, DTRA serves as the U.S.

Government lead for post-detonation National Technical Nuclear Forensics (NTNF) research and development (R&D). As the central NTNF R&D coordinator, DTRA works in consultation with interagency partners to develop and improve ground-based capabilities supporting exploitation and attribution missions. NTNF R&D supports advanced research in the following areas: (1) Prompt nuclear effects exploitation for attribution; (2) nuclear device characterization for forensics; (3) nuclear forensic materials exploitation for attribution.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RF: Forensics Technologies	25.535	33.578	-
Description: Project RF supports nuclear forensics by developing: (1) technologies, systems and procedures for post detonation nuclear forensics; (2) on/off-site analysis to meet forensic, verification, monitoring and confidence-building requirements; (3) technologies to detect, locate, identify, track, and interdict nuclear and radiological threats, including enablers to their acquisition and development.			
FY 2019 Plans: - Lead a DoD and interagency, end-to-end nuclear forensics process technology demonstration and evaluation of DTRA-developed technologies/methodologies to assess NTNF process improvements and identify potential capability gaps in forensic conclusion confidence, timeliness, and accuracy, and assist in assessing contribution to interagency attribution process and decisions. - Demonstrate 50% decrease in the material nuclear forensics fixed lab process timeline, with increased confidence and decreased technical uncertainties, improving capacity to make conclusions with low uncertainty and high confidence in a relevant timeframe.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Support Discreet Oculus ground-based prompt diagnostics sensor system in support of transfer/transition to USAF U.S. Prompt Diagnostics System (USPDS) program of record. - Complete design, build and installation of regional array, in preparation for transition of array to partner organization. - Modify Forensics Inversion Tool Suite (FITS) and Design Signature Database (DSD) forensic tools to better meet stakeholder needs for forensic devices. Los Alamos National Lab FITS tool modifications are being done in conjunction with the Stockpile program. - Prepare to transition recently developed device assessment research and development capabilities to partners at the National Nuclear Security Administration. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The decrease from FY 2019 to FY 2020 is due to the realignment of Project RF-Forensics Technologies into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	25.535	33.578	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RF: *Counter Weapons of Mass Destruction Applied Research*	6.803	10.257	-	-	-	-	-	-	-	-	-
• 127/0605000BR/RF: *Counter Weapons of Mass Destruction Systems Development*	6.199	6.163	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
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 / ***Counter WMD Technologies and Capabilities Development	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RG: ****Counter WMD Technologies and Capabilities Development*	134.888	40.688	20.277	235.087	-	235.087	238.668	242.425	246.630	250.582	Continuing	Continuing

Note

Defense Threat Reduction Agency's (DTRA) consolidated projects RE-Counter-Terrorism Technologies, RM-WMD Counterforce Technologies, RR-CWMD Test and Evaluation, and RT-Target Assessment Technologies, into the renamed project RG-Counter WMD Technologies and Capabilities Development. There is 15.1% real growth in this project.

***Project RG title changes from Defeat Technologies to Counter WMD Technologies and Capabilities Development in FY 2020.

A. Mission Description and Budget Item Justification

Counter WMD Technologies and Capabilities Development encompasses the following areas.

1. Defeat Technologies develops, integrates, demonstrates, and transitions innovative kinetic and non-kinetic weapon capabilities to expand traditional and asymmetric options available to Combatant Commanders to deny, disrupt, and defeat Weapons of Mass Destruction (WMD) while minimizing collateral effects.

2. Technology development focuses on the physical or functional defeat of (1) chemical, biological, nuclear, and radiological threat materials, (2) an adversary's ability to deliver the same, as well as (3) the physical and non-physical support networks enabling both. This program achieves these goals through the systematic identification and maturation of technologies capable of defeating WMD agents or agent-based processes, then integrating them into weapons, delivery systems, or rapid WMD elimination capabilities. This effort includes developing specific WMD agent/agent-based process simulants, test infrastructure, and sampling capability required for effective development, testing, and evaluation of next generation capabilities to ensure optimum weapon solutions are achieved. Requirements are delineated in Agency Priority Lists for lethal and non-lethal Countering WMD (CWMD) capability. Based on specified requirements, weapons and capabilities are transitioned to a Service program of record for system acquisition.

3. Counter-terrorism technologies research develops and transitions a full spectrum of new technologies to counter emergent WMD threats. 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 terrorist WMD development and acquisition pathways, to include defeat of the devices themselves, while minimizing risks to U.S. forces; (2) counterterrorism concepts and technologies to integrate and synchronize activities that prevent terrorists 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 / ****Counter WMD Technologies and Capabilities Development*

4. Counterforce technologies research develops, integrates, demonstrates, and transitions capabilities to find, characterize, assess, and plan for the defeat of WMD threats. This research is focused in three areas: (1) WMD battlespace awareness provides warfighters with tools to find, characterize, and assess WMD threats; (2) The weapons effects research provides modernized, fast-running, validated CWMD planning tools and integrates modeling and simulation software to optimize the execution of WMD and associated hard target defeat operations; (3) innovative engineering of select promising technologies discovered under fundamental and basic research to increase the effectiveness of weapons against blast doors and other underground structures for functional defeat of Underground Facilities (UGFs), WMD, and their delivery systems.

5. DTRA provides a unique national test bed capability for simulated weapons of mass destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat testing. This test bed is capable of responding to operational needs outside of DTRA's research portfolio and is used by the DoD, Military Services, Combatant Commanders, and other Federal Agencies to evaluate the implications of WMD, conventional weapons, and other special weapons used against U.S. military or civilian systems and targets.

6. Target assessment technologies research develops, integrates, tests, demonstrates, and transitions processes and technologies providing advanced capabilities in the areas of WMD target assessment, automated advanced targeting development (A2TD) and full dimensional defeat. This research develops analytical tools and processes required to: (1) find and characterize WMD targets and associated hard and deeply buried targets (HDBTs); and (2) assess the results of physical and functional defeat mechanisms (such as direct attack). The A2TD initiative seeks to apply emerging computer assisted technologies to automate target characterization for hard targets and WMD targets. The end result will be faster and more efficient characterization of important hard targets and WMD targets. The full dimensional defeat project 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 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 2018	FY 2019	FY 2020
Title: RG: Counter WMD Technologies and Capabilities Development	30.688	10.277	235.087
Description: Project RG develops advanced technologies and weapon concepts and validates their applicability to CWMD.			
FY 2019 Plans: - Complete full scale development and testing of Agent Defeat Penetrator weapon in preparation for its consideration in a United States Air Force (USAF) analysis of alternatives. - Continue full scale prototype demonstration of novel access denial technology in an operational environment. - Build-out prototype of second version of autonomous system and demonstrate system and payload in a relevant environment. - Collect signatures on IED/sUAS in a predictive environments using modeling & simulation. - Provide advanced infrastructure to improve collection of signatures including sensors, lab and field equipment, collection software, and collection tools.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 / ****Counter WMD Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Provide advanced IED/sUAS library analytics to improve database management (including entry, creation of information and vetting of information), search functionality, and 3rd party database queries. - Provide curation, dissemination, and access to collected data. - Develop and establish standardized data collection protocols. - Build, procure, and validate advanced and improvised threats to assist in threat risk analysis. - Develop IED/sUAS Identify Friend or Foe (IFF) low cost solutions to support U.S. forces and improve sensor detection while decreasing false alarm rates and reporting. - Identify and develop passive threat detections for IED/sUAS systems as the technology continues to develop in private industry. - Develop counter-measures to detect and defeat multi-agent enemy IED/sUAS. - Develop acoustic disrupters to defeat enemy IED/sUAS. - Improve sensor integration of C-IED/C-sUAS systems to improve detection and defeat capabilities and reduce the human in the loop. - Develop capability for manned aircraft to detect IED/sUAS in order to protect manned aircraft from potential threat IED/sUAS effects. - Provide Testing site/location, personnel and Data collection/Analysis and Test reporting for DTRA Counter-Small Unmanned Aircraft Unmanned Aerial Systems (C-sUAS) Defeat One (CD-I) testing event. This test event is formerly known as Hard Kill II which also took place at White Sands Missile Range (WSMR), MNNM. - Provide RED Team personnel oversight for UAS threat device operations during test scenarios. Inventory and maintain threat UAS documentation and ensure accurate records are maintained as required. - Coordinate and maintain Vendor and Visitor personnel roster, range access request, safety briefings and communications plan as required during the duration of CD-I.			
FY 2020 Plans: - Finalize full scale testing of the Agent Defeat Penetrator fill. - Continue full-scale prototype demonstration of novel access denial technology in an operational environment. - Continue to develop offensive counterproliferation, counter-WMD technologies in support of combatant command requirements. - Continue to develop WMD pathway defeat technologies, as well as threat-specific test articles and analyses. - Continue to develop lighter, smaller, more effective breaching capabilities. - Continue to develop next generation WMD detection technology applications. - Continue to integrate HPC software tools into Dynamic Picture of the Operating Environment (DPOE), leveraging capabilities of high performance computing to improve automated analytics to more accurately or quickly identify events, actors and threats. - Develop and integrate advanced algorithms and refine an operational framework for a mission planning tool to enhance warfighter capabilities to search for, detect, and identify chemical threats prior to release.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 / ****Counter WMD Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Demonstrate a miniaturized chemical warfare agent collection and detection capability for trace-level and remote CWMD search missions. - Initiate development of remote sensing and characterization capabilities to aid in the detection and identification of biological weapons production facilities. - Continue to develop, integrate and demonstrate advanced CWMD sensing payloads for both unmanned and remote sensing missions. - Initiate development of a Chemical Intelligence, Surveillance, and Reconnaissance area search mission planning tool to enhance capabilities to search for, detect, and identify chemical threats prior to release. - Continue to conduct mission-oriented experiments to model, simulate, analyze, or exploit technical capabilities intended to counter WMD or mitigate risks and impacts to critical assets in operationally relevant conditions. - Continue to develop enhancements to the Integrated Munitions Effects Assessment modeling and simulation planning tool. - Continue support for Combatant Command exercises and planning events at the Nevada Test Bed to develop target defeat technologies, tools, and capabilities. - Continue to develop and maintain interagency capabilities and special tests in support of national priority programs and mission requirements. - Integrate engineering rule-based development for automated advanced targeting characterization efforts to meet CCMD and IC WMD and HDBT characterization and defeat requirements. - Continue to develop the Functional Full Dimensional Defeat Enterprise process including developing new means for identifying facility functions, determining defeat vulnerabilities in support of attack planning and execution, and determining new battle damage information methods. - Continue cooperative CWMD project technical exchange with the United Kingdom (UK) in support of US/UK Project Agreement. - Continue Coalition Warfare Program Agreement with Republic of Korea for advancement of autonomous tunnel exploitation technologies. - Continue to develop complex geotechnical models for support of geotechnical site characterization of WMDhard target sites. - Continue to develop enhancements to WMDpedia for DPOE and the Sensitive Site Exploitation mobile application. - Continue to assess and develop analytic capabilities to enhance the warfighter’s ability to conduct predictive analysis and forecast potential WMD threats informing future CWMD requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase from FY 2019 to FY 2020 is due to the realignment of Project RE-Counter Terrorism Technologies, Project RM-WMD Counterforce Technologies, Project RR-CWMD Test and Evaluation, and Project RT-Target Assessment Technologies into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 / ****Counter WMD Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Additionally, DTRA increased investment in the development of classified and unclassified USCENTCOM and USSOCOM efforts to counter threat networks by assessing, identifying, and providing capabilities to maintain technological superiority. Real growth in this project is 15.1%.			
Accomplishments/Planned Programs Subtotals	30.688	10.277	235.087

	FY 2018	FY 2019
Congressional Add: Target Sensing Technologies	10.000	10.000
FY 2018 Accomplishments: - Completed software spiral development for five prototypes for target sensing technologies. Details classified. - Completed algorithm development and integration with mission performance capabilities, resulting in software configuration control board system recommendations and analysis. Details classified. - Initiated development and fabrication of additional prototype systems. Details classified. ***FY 2019 Plans:*** - Funds pre-award requirement for follow-on contract vehicle for transition of program and systems development to Service/Warfighter. Procurement sensitive. - Purchases up to 20 test prototypes systems in existing and new form factors for target sensing technologies. Details classified. - Funds further development of additional algorithm development and integration with mission performance capabilities, resulting in software configuration control board system recommendations and analysis. Details classified.		
Congressional Adds Subtotals	10.000	10.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RG: *Counter Weapons of Mass Destruction Applied Research*	8.483	8.959	22.253	-	22.253	22.958	22.919	23.715	24.190	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 / ****Counter WMD Technologies and Capabilities Development*

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development	Project (Number/Name) RI / Nuclear Survivability	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RI: *Nuclear Survivability*	50.493	7.289	5.783	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	63.565

Note

Beginning in FY 2020, efforts in this project are captured under project RD-Nuclear Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

The Nuclear Survivability project develops, integrates, demonstrates, and transitions 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 Department of Defense (DoD) Instruction 3150.09, Chemical, Biological, Radiological, and Nuclear (CBRN) Survivability Policy. The Defense threat Reduction Agency (DTRA) is the DoD-designated center of excellence for electromagnetic pulse survivability assessments. The System Vulnerability and Assessment effort develops nuclear assessment capabilities to support operational planning, weapon 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. The radiation-hardened nano-electronics effort develops and integrates radiation-hardened, high-performance prototype nano-electronics to meet DoD space and strategic deterrence system requirements. The Human Survivability effort supports the Nuclear Test Personnel Review Program (NTPR), confirming the participation of Atomic Veterans in nuclear testing and radiological events and providing radiation dose assessments. The NTPR is administered by the Department of Veterans Affairs and the Department of Justice for radiogenic disease compensation programs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RI: Nuclear Survivability	7.289	5.783	-
Description: Project RI develops, integrates, and transitions novel technologies that radically enhance the survivability and resilience of DoD nuclear forces and their associated control and support systems in the event of an attack or other hostile action.			
FY 2019 Plans: - Produce appropriate new or updated standards and handbooks to capture critical information for DoD to verify and validate mission critical systems. - Coordinate Satellite System Natural and Nuclear Environment Protection Standard with DoD Stakeholders and the DoD Standardization Program Office. - Continue producing technical reports addressing DoD radiogenic disease concerns; which address Congressional interest in historical veteran radiation exposure and present day radiological exposures of the DoD-affiliated population. - Evaluate Commercial Off the Shelf (COTS) radiation-hardened microelectronics from trusted, commercial sources. - Conduct research to characterize radiation-hardened materials and determine viability for inclusion in DOD systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RI / *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Final independent verification and validation (IV&V) of DIAMONDS coding and data prior to migration to DIAMONDS Next Generation. - Codify the Information Assurance and Accreditation documentation for the transition from Defense Integration and Management of Nuclear Data Services (DIAMONDS) to DIAMONDS Next Generation. Provide supporting documentation to DISA for DIAMONDS cloud operation in support of Federal Data Center Consolidation Initiative. - Commence concurrent DIAMONDS and DIAMONDS Next Generation testing for functional and data validation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The decrease from FY 2019 to FY 2020 is due to the realignment of Project RI-Nuclear Survivability into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	7.289	5.783	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RI: *Counter Weapons of Mass Destruction Applied Research*	25.545	32.732	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development*	Project (Number/Name) RL / *Nuclear & Radiological Effects*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RL: *Nuclear & Radiological Effects*	3.390	8.505	3.427	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.322

Note

Beginning in FY 2020, efforts in this project are captured under project RD-Nuclear Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

The Nuclear and Radiological Effects project develops, integrates, and transitions nuclear and radiological assessment modeling tools for use in military planning processes. The assessment modeling tools provide critical analytics for Consequence of Execution (COE) considerations during nuclear targeting and post-detonation nuclear response, supporting interagency strategic and tactical decision making. These COE considerations can include the full range of political, military, economic, social, infrastructure, and information (PMESII) factors and their interaction, extending analytical capabilities beyond common damage assessment practices and into second and third order effects. These activities/efforts support Combatant Commands and other Department of Defense (DoD) organizations by providing accurate and reliable consequence assessment and response information.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RL: Nuclear and Radiological Effects	8.505	3.427	-
Description: Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions. ***FY 2019 Plans:*** - Develop natural gas and water/seawater effects models in support of U.S. Strategic Command (USSTRATCOM) Consequences of Execution (COE) efforts, linking higher order effects to PMESII analyses. - Integrate, demonstrate, and deliver a suite of consistent and enhanced models, tools, references, and data to US and Allied nuclear weapon effects stakeholders. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The decrease from FY 2019 to FY 2020 is due to the realignment of Project RL-Nuclear and Radiological Effects into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	8.505	3.427	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RL / *Nuclear & Radiological Effects*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RL: *Counter Weapons of Mass Destruction Applied Research*	30.320	29.388	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development	Project (Number/Name) RM / *WMD Counterforce Technologies*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RM: *WMD Counterforce Technologies*	173.550	23.667	25.243	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	222.460

Note

Beginning in FY 2020, efforts in this project are captured under project RG-Counter WMD Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

The Weapons of Mass Destruction (WMD) Counterforce Technologies project develops, integrates, demonstrates, and transitions emerging technologies enabling efforts to find, characterize, assess, and plan for the defeat of WMD threats. There are three core research efforts in this project: (1) The WMD battlespace awareness effort provides warfighters with capabilities to find, characterize, and assess WMD threats. This effort develops and integrates sensing technologies with multi-mission Unmanned Aerial System payloads. (2) The Countering WMD (CWMD) weapons effects effort develops modernized, fast-running, validated CWMD planning tools and integrates modeling and simulation software to optimize the execution of WMD and associated hard target defeat operations. (3) The Innovative Technologies and Engineering effort takes promising technologies discovered under fundamental and basic research and further develops them to increase the effectiveness of weapons against blast doors and other underground structures for functional defeat of Underground Facilities (UGFs), WMD, and their delivery systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RM: WMD Counterforce Technologies	23.667	25.243	-
Description: Project RM provides: (1) full-scale testing of CWMD weapons effects, weapon effects modeling, and weapon delivery system optimization; and (2) WMD sensor, surveillance, and data processing technologies. ***FY 2019 Plans:*** - Complete Chemical Intelligence, Surveillance, and Reconnaissance (ISR) area search mission planning tool proof of concept to enhance capabilities to search for, detect, and identify chemical threats prior to release. - Transition the Loop-mediated isothermal Amplification (LAMP), the Biological ISR Sample Collection (SCOUT), and the Sampling Capability Improvement Project (SCIP) to the Joint Program Executive Office – Chemical and Biological Defense (JPEO-CBD) in support of Biological ISR sample collection capability improvements. - Conduct mission-oriented experiments to model, simulate, analyze, or exploit technical capabilities intended to counter WMD or mitigate risks and impacts to critical assets in operationally relevant conditions.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Release updated version of modernized, fast-running, validated Integrated Munitions Effects Assessment, a CWMD modeling and simulation (M&S) planning tool, incorporating near-miss lethality, weapons data, and concrete modeling, to optimize the execution of WMD and associated hard target defeat operations. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The decrease from FY 2019 to FY 2020 is due to the realignment of Project RM into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	23.667	25.243	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RM: *Counter Weapons of Mass Destruction Applied Research*	13.956	12.780	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
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	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RR: *CWMD Test and Evaluation*	16.052	0.000	12.394	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.446

Note

Beginning in FY 2020, efforts in this project are captured under project RG-Counter WMD Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

The Countering WMD Test and Evaluation Project RR provides a unique national test bed capability for simulated weapons of mass destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs by developing and maintaining test beds used by the Department of Defense (DoD), the Military Services, the Combatant Commanders and other Federal Agencies to evaluate the implications of WMD, conventional, and other special weapon use against U.S. military or civilian systems and targets.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RR: Countering WMD Test and Evaluation	0.000	12.394	-
Description: Project RR provides a unique national test bed capability for simulated WMD facility characterization, weapon-target interaction, and WMD facility defeat testing. ***FY 2019 Plans:*** - Continue support for Combatant Command exercises and planning events at the Nevada Test Bed in order to develop target defeat technologies, tools, and capabilities. - Maintain and further develop interagency capabilities and special tests in support of national priority programs and mission requirements. - Support the planning, execution, and analysis of two major CWMD test and demonstration events at the Nevada National Security Site or other locations within or outside the continental U.S. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The decrease from FY 2019 to FY 2020 is due to the realignment of Project RR-Countering WMD Test and Evaluation into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	0.000	12.394	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RR: *Counter Weapons of Mass Destruction Applied Research*	12.810	14.345	17.816	-	17.816	18.156	18.451	17.775	18.131	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development	Project (Number/Name) RT / Target Assessment Technologies	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RT: *Target Assessment Technologies*	293.941	45.770	33.871	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	373.582

Note

Beginning in FY 2020, efforts in this project are captured under project RG-Counter WMD Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

The Target Assessment Technologies project develops, integrates, tests, demonstrates, and transitions processes and technologies providing advanced capabilities in the areas of Weapons of Mass Destruction (WMD) target assessment and functional defeat. The functional defeat process includes 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. Applying these processes to time-dependent constraints related to WMD target characterization and threat analysis presents a further technical challenge. This project develops analytical tools and processes required to (1) find and characterize WMD targets and associated hard and deeply buried targets (HDBTs) and to (2) to assess in real time the results of physical and functional defeat operations (such as a direct attack). These novel, dynamic capabilities enable Combatant Commands (CCMDs) and the intelligence community (IC) to hold at risk high value targets possessed by adversaries.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RT: Target Assessment Technologies	45.770	33.871	-
Description: Project RT provides CCMDs and the IC with technologies and processes to find and characterize WMD targets and hard and deeply buried targets and then assess the results of attacks against those targets.			
FY 2019 Plans: - Complete engineering rule-based development for automated advanced targeting characterization efforts to meet CCMD and IC WMD and HDBT characterization and defeat requirements. - Further develop the Functional Defeat Enterprise process including identifying facility functions, determining defeat vulnerabilities in support of attack planning and execution, and determining new battle damage information methods. - Develop cooperative CWMD project technical exchange with the United Kingdom (UK) in support of a U.S./UK Project Agreement. - Continue to develop complex geotechnical models for support of geotechnical site characterization of WMD target sites.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RT / *Target Assessment Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
The decrease from FY 2019 to FY 2020 is due to the realignment of Project RR-Target Assessment Technologies into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	45.770	33.871	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.