Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Defense Threat Reduction Agency											Date: February 2016	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	1,111.083	287.903	290.310	266.444	-	266.444	259.490	265.359	269.287	274.594	Continuing	Continuing
RA: *Information Sciences and Applications*	21.282	0.250	12.244	11.422	-	11.422	11.323	12.761	13.004	13.266	Continuing	Continuing
*RD: *Detection Technologies*	0.000	0.000	29.893	17.775	-	17.775	17.989	19.047	21.210	21.553	Continuing	Continuing
RE: *Counter-Terrorism Technologies*	446.219	105.096	104.284	102.976	-	102.976	105.522	107.530	109.729	111.960	Continuing	Continuing
*RF: *Forensics Technologies*	293.702	63.115	38.427	38.540	-	38.540	42.454	43.727	42.518	43.367	Continuing	Continuing
RG: *Defeat Technologies*	65.774	29.293	22.489	20.710	-	20.710	22.355	22.752	23.227	23.707	Continuing	Continuing
RI: *Nuclear Survivability*	32.580	5.328	6.191	6.561	-	6.561	6.658	6.738	6.863	7.002	Continuing	Continuing
RL: *Nuclear & Radiological Effects*	-	0.000	0.000	3.528	-	3.528	1.582	1.617	1.658	1.691	Continuing	Continuing
RM: *WMD Counterforce Technologies*	104.036	27.099	20.717	23.138	-	23.138	26.057	24.939	24.299	24.721	Continuing	Continuing
**RR: *Countering WMD Test and Evaluation*	1.902	12.150	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
RT: *Target Assessment Technologies*	145.588	45.572	56.065	41.794	-	41.794	25.550	26.248	26.779	27.327	Continuing	Continuing

Note

*Project RF-Detection and Forensics Technologies subdivides into Projects RD-Detection Technologies and RF-Forensics Technologies in FY 2016.
**Project RR title changes from Combating WMD Test and Evaluation to Countering WMD Test and Evaluation beginning in FY 2017.

A. Mission Description and Budget Item Justification

The Defense Threat Reduction Agency (DTRA) Counterproliferation Initiatives - Proliferation, Prevention, and Defeat program element funds the development and testing of subsystems and components for integration into prototype systems with the potential to transition into mature, state-of-the-art weapons of mass destruction (WMD) surveillance, detection, defeat, prevention, nonproliferation, counterproliferation, consequence management, and treaty verification capabilities.

The Counterproliferation Initiatives - Proliferation, Prevention, and Defeat portfolio is aligned with strategic planning objectives as well as with science and technology (S&T) investment direction which is established annually by DTRA and the US Strategic Command Center for Combating Weapons of Mass Destruction (SCC-WMD).

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Defense Threat Reduction Agency	Date: February 2016
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*

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

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	291.694	290.654	283.236	-	283.236
Current President's Budget	287.903	290.310	266.444	-	266.444
Total Adjustments	-3.791	-0.344	-16.792	-	-16.792
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.791	-			
• Realignments	-	-	-10.600	-	-10.600
• FFRDC & Economic Assumptions	-	-0.344	-2.155	-	-2.155
• Other Reductions	-	-	-4.037	-	-4.037

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: RG: *Defeat Technologies*		
Congressional Add: *Technology Solutions Supporting Operations in Subterranean Environments*	8.000	-
Congressional Add Subtotals for Project: RG	8.000	-
Congressional Add Totals for all Projects	8.000	-

Change Summary Explanation

The decrease in FY 2017 from the previous President's Budget submission is due to the net effect of the transition of full effects modeling technology from applied research (6.2) to advanced technology development (6.3), decreased investment in detection technologies in (6.3) to fund increased investment in targeting support, and threat forecasting in (6.2). This is part of an overall Agency rebalancing of near term operational needs with future technical developments and

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Defense Threat Reduction Agency	Date: February 2016
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 Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*

capabilities. Other reductions were in support of Departmental efficiencies, Federally Funded Research and Development Centers (FFRDC), and economic assumptions. Reductions to the RDT&E portfolio impacted investment in efforts with lower return on investment, lower customer demand, or that were early in the development cycle.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	Project (Number/Name) RA / *Information Sciences and Applications*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
RA: *Information Sciences and Applications*	21.282	0.250	12.244	11.422	-	11.422	11.323	12.761	13.004	13.266	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Information Sciences and Applications project provides technical expertise and reach-back 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.

The increase from FY 2015 to FY 2016 is due to the realignment of funding for Technical Reachback from Project RM to Project RA-Information Sciences and Applications. The decrease from FY 2016 to FY 2017 is due to the net effect of increased investment in hazard and effects characterization and decreased investment in technical reachback.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RA: Information Sciences and Applications	0.250	12.244	11.422
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 2015 Accomplishments:*** - Provided for upward obligation adjustments supporting contract closeout efforts. ***FY 2016 Plans:*** - Continue development of global synthetic population and activity database for modeling secondary and tertiary effects using agent-based, socially coupled simulations to enable rapid modeling of infectious disease propagation and impacts of population behaviors and movement after a WMD event. - Develop detailed models of specified nuclear facilities to analyze vulnerabilities and estimate hazards. ***FY 2017 Plans:*** - Continue to develop the global synthetic population and activity database for modeling infectious disease propagation and impacts of population behaviors and movement after a WMD event. - Continue to develop detailed models of specified nuclear facilities to analyze vulnerabilities and estimate hazards.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Enhance 64-bit version of CWMD modeling and simulation planning tools for analysis of large data sets.			
Accomplishments/Planned Programs Subtotals	0.250	12.244	11.422

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *WMD Defeat Technologies*	26.334	29.432	29.127	-	29.127	33.255	33.513	30.990	31.405	Continuing	Continuing
• 151/0605502BR: *Small Business Innovation Research*	9.606	-	-	-	-	-	-	-	-	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 the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** *RD / *Detection Technologies*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
*RD: *Detection Technologies*	0.000	0.000	29.893	17.775	-	17.775	17.989	19.047	21.210	21.553	Continuing	Continuing

Note

*Project RF-Detection and Forensics Technologies subdivides into Projects RD-Detection Technologies and RF-Forensics Technologies in FY 2016.

A. Mission Description and Budget Item Justification

The Detection Technologies project continues research formerly conducted under project RF. This project develops, integrates and transitions advanced concepts, technologies and subsystems enabling enhanced nuclear and radiological location, identification, and tracking capabilities. Leveraging gains made in applied research efforts, this project produces advancements in range, process time, sensitivity and accuracy. In addition, this project continues the development of novel concepts and technologies enabling the identification and exploitation of non-radiation based signatures associated with nuclear threats (e.g., transportation of nuclear materials, patterns of activity, or unique materials).

The increase from FY 2015 to FY 2016 is due to the subdivision of Project RF-Detection and Forensics Technologies into projects RD-Detection Technologies and RF-Forensics Technologies beginning in FY 2016. The decrease from FY 2016 to FY 2017 is due to decreased investment in radiation detection and nuclear threat detection intelligence, surveillance and reconnaissance technologies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RD: Detection Technologies	-	29.893	17.775
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 2016 Plans:*** - Analyze nuclear threat signatures to improve or integrate their collection into sensor systems. - Integrate nuclear threat analysis algorithms into existing systems to test and evaluate their effectiveness in reducing processing time. - Demonstrate, test, and field systems to remotely monitor small and wide areas which may produce or contain nuclear threats. - Design and fabricate prototype passive detection systems for determining the location and signature of nuclear material and test and characterize developmental prototype passive detection systems. - Improve performance of new detector materials; imaging and spectroscopy systems; and signals analysis methods through rigorous laboratory and field testing. - Integrate advances in materials science into lightweight, high-resolution radiation spectrometers for use in field operations.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** *RD / *Detection Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Transition near-term technologies to generate prototypes and design packages that will assist operational users. - Conduct advanced/operational testing and evaluation of radiation detection systems to assess their performance. - Develop and build a new high resolution detector with reduced weight and improved form factors that can be concealed in container consistent with the operational environment. - Integrate new cellular technology into the Radiological/Nuclear (R/N) search network to ensure rapid flow of data from detectors. - Exploit the prototype testing of Oak Ridge National Laboratory to develop an operationally useful roadside detector capable of detecting nuclear material in moving vehicles. - Test and evaluate the integration of high resolution detectors with lower resolution detectors to determine the potential to meet threshold R/N detection requirements. ***FY 2017 Plans:*** - Continue to develop and integrate nuclear and radiological signature collections into new sensor systems. - Continue to integrate nuclear threat analysis algorithms into existing systems in order to evaluate accuracy and effectiveness in reducing process time. - Continue to demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas. - Continue to develop high-fidelity radiation test objects supporting advanced assessment capabilities in order to improve radiation detection prototypes. - Continue to develop, test, and evaluate a hand-held radiation monitor replacement providing radioisotope identification capability and real-time information feed. - Develop and deploy devices enabling low cost operational testing and evaluation of radiation signature detectors against mock special nuclear material sources of interest. - Develop and integrate interoperable systems enabling a true common operational picture among nuclear and radiological search teams, across platforms, and within shared or distributed areas. - Test and evaluate new radiation detection technologies in order to validate capabilities, improve prototypes, and provide required performance data to support follow-on development. - Test and evaluate an operational high resolution gamma-ray imager suited for multiple mission sets to support integration with next generation nuclear imaging systems. - Simulate and evaluate loose nuke scenarios in order to validate nuclear threat mitigation plans developed by Department of Defense and civilian users.			
Accomplishments/Planned Programs Subtotals	-	29.893	17.775

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** *RD / *Detection Technologies*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *WMD Defeat Technologies*	-	25.920	15.936	-	15.936	16.332	16.093	17.586	17.940	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 the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RE / *Counter-Terrorism Technologies*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
RE: *Counter-Terrorism Technologies*	446.219	105.096	104.284	102.976	-	102.976	105.522	107.530	109.729	111.960	Continuing	Continuing

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.

The decrease from FY 2015 to FY 2016 is due to the deferment of lower priority projects until further maturation in the technology readiness level. The decrease from FY 2016 to FY 2017 is due to reduced investment in next generation CWMD technologies to balance other priorities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RE: Counter-Terrorism Technologies	105.096	104.284	102.976
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 2015 Accomplishments:*** - Continued planned development and transition of new counterproliferation technologies for Joint U.S. Military Forces to counter WMD, enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities. - Continued work on successive multi-year efforts to develop high fidelity test articles and enhanced electronic test objects for the Explosive Ordnance Disposal (EOD) Device Defeat. - Developed impeded tools for IED triggers. - Continued to support Combatant Commanders' planning efforts related to countering terrorist use of Weapons of Mass Destruction (CWMD-T). - Continued multi-year efforts to develop and transition innovative CWMD tools designed to locate, identify, characterize, assess, and attack WMD production and storage facilities with minimal-to-no collateral damage or loss of life. - Developed precision shaped charges using a proven manufacturing process through the use or modification of an existing shaped charge design.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RE / *Counter-Terrorism Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Transitioned next generation imaging technologies to allow EOD forces advanced diagnostic capabilities. - Completed evaluation of a baseline system for extracting events related to WMD pathway models. This system will support Natural Language Processing and Machine Reading capabilities for knowledge discovery in the data/information pipeline for Combatant Command CWMD analysis and planning. - Developed Streaming Cloud Analytics Platform (SCALPL) for WMD Pathway model viewing and extraction of information to the knowledge base--integration into the system awaits Information Assurance approval for deployment on the Joint Worldwide Intelligence Communications System (JWICS). - Established collaborative development of the Dynamic Picture of the Operating Environment (DPOE) using the DTRA Experimental Lab (DEL) as the testbed for unclassified systems evaluation through a remotely accessible virtual private network. - Initiated development of a Bayesian Network model to predict intention by non-state actors to use chemical or biological weapons.			
FY 2016 Plans: - Continue other planned development and transition of new counterproliferation technologies for Joint U.S. Military Forces to counter WMD, enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities. - Continue work on successive multi-year efforts to develop high fidelity test articles and enhanced electronic test objects for EOD Device Defeat. - Develop tools used to impede IED triggers and conduct render safe diagnostics validation tests on emergent threat articles. - Continue to support Combatant Commanders' planning efforts related to CWMD-T - Continue multi-year efforts to develop and transition innovative CWMD tools designed to locate, identify, characterize, assess, and attack WMD production and storage facilities with minimal-to-no collateral damage or loss of life. - Build precision shaped charges using a proven manufacturing process through the use or modification of an existing shaped charge design. - Transition next generation imaging technologies to allow EOD forces advanced diagnostic capabilities. - Begin exploration and application of techniques to extract information from audio, photographic, and videographic files. - Apply rational choice and game theory constructs to prototype advanced Bayesian models.			
FY 2017 Plans: - Integrate enhancements in Natural Language Processing and Machine Reading capabilities into JWICS knowledge management and planning tools. - Integrate, test and deploy socio-cultural and behavioral factor data into the Intent Model to enhance threat prediction capabilities. - Develop applications enabling seamless information sharing between the USSOCOM CWMD Support Program (SCSP) and other intelligence agency databases.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RE / *Counter-Terrorism Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Develop customizable dashboards displaying user-driven data displays and functionality on the SCSP JWICS portal. - Continue to support Combatant Command exercises and planning events in order to enhance existing SCSP tools and databases, and to identify and validate new requirements. - Continue to monitor and collaborate with other agencies, such as the Defense Advanced Research Projects Agency and the Intelligence Advanced Research Projects Agency, on advanced analytics technologies.			
Accomplishments/Planned Programs Subtotals	105.096	104.284	102.976

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *WMD Defeat Technologies*	0.963	-	-	-	-	-	-	-	-	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 the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** *RF / *Forensics Technologies*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
*RF: *Forensics Technologies*	293.702	63.115	38.427	38.540	-	38.540	42.454	43.727	42.518	43.367	Continuing	Continuing

Note

*Project RF-Detection and Forensics Technologies subdivides into Projects RD-Detection Technologies and RF-Forensics Technologies in FY 2016.

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 US 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.

The decrease from FY 2015 to FY 2016 in Project RF is due to the realignment of nuclear threat detection activities into Project RD-Detection Technologies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RF: Forensics Technologies	63.115	38.427	38.540
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 2015 Accomplishments: - Identified all-source nuclear threat signatures, characteristics, and corresponding detection modalities; continued the identification and development of the proper tipping, queuing, and data fusion techniques and algorithms to enable the rapid and effective accumulation of all-source intelligence on nuclear threat scenarios. - Designed and fabricated prototype passive detection systems for determining the location and signature of nuclear material; test and characterize developmental prototype passive detection systems. - Initiated integration of recent advances in materials science into lightweight, high-resolution radiation spectrometers for use in field operations.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** *RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Developed, demonstrated, and fielded methods to remotely monitor small and wide areas which may contain nuclear threats. - Developed advanced three-dimensional imaging technologies for high resolution source characterization and identification to provide new and improved capabilities to detect, locate, identify, and characterize threat materials. - Initiated transition of multiple near term technologies to generate prototypes and design packages to assist operational users. - Conducted advanced and operational testing and evaluation of radiation detection systems. - Initiated design, development, and fabrication of new radiological test objects. - Improved performance of new detector materials, imaging and spectroscopy systems, and signals analysis methods through rigorous laboratory and field testing. - Developed, tested, evaluated, and delivered software tools and capabilities to locate and identify the signatures of Special Nuclear Materials on both existing and newly developed hardware platforms. - Continued development, accelerate development where appropriate, demonstrate, and field methods to remotely monitor small and wide areas which may contain nuclear threats. - Developed, tested, demonstrated, and fielded prototype ground-based sensor capabilities for post-detonation prompt diagnostics under DISCREET OCULUS. - Completed installation of prompt diagnostics systems in a second U.S. city. - Continued to develop, test, demonstrate, and field (prototype) upgraded technical capabilities for prompt diagnostics, debris collection, sample analysis, modeling to support nuclear device reconstruction, and forensics data to decrease timeline, lower uncertainties, and increase confidence in technical nuclear forensics conclusions. - Continued near-source strong-motion small-scale tests and high fidelity analyses for detection and identification of low yield and evasive testing. - Developed modular prototype using advanced materials for particulate and gaseous radionuclides detection of evasive testing in support of U.S. and international treaty monitoring requirements. - Provided science and technology development to support onsite inspections. - Transitioned wide area search modular prototypes into an operational configuration to replace the current systems. - Transitioned software improvements to current R/N detector technologies. - Transitioned selected ship search capabilities into an operational configuration for fielding to the Technical Support Groups. - Continued to enhance Countering WMD (CWMD) network technologies by exploiting the operational advantages of DoD's cellular communications program. - Continued to expand non-radiological sensor support for R/N search operations. - Expanded the development of CWMD/Technical Support Group training technologies for R/N search equipment. - Completed the documentation for a JROC approved Radiological/Nuclear modernization program. - Selected a wide area search modular design and developed the operational configuration to replace the current systems. - Implemented 1st generation software improvements to current R/N detector technologies.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** *RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Completed final operational configuration for ship search detectors and initiated maritime evaluation for final fielding decision.			
FY 2016 Plans:			
- Complete development, test, demonstration, and fielding of prototype ground-based sensor capabilities in three U.S. cities for post-detonation prompt diagnostics under DISCREET OCULUS.			
- Continue to develop, test, demonstrate, and field (prototype) upgraded technical capabilities for prompt diagnostics, debris collection, sample analysis, modeling to support nuclear device reconstruction, and forensics data to decrease timeline, lower uncertainties, and increase confidence in technical nuclear forensics conclusions.			
- Continue to develop tools based on near-source small-scale strong-motion science to assist detection and characterization of low yield and evasive testing.			
- Conduct additional laboratory experiments with lasers to assess shock/seismic signatures from underground nuclear tests.			
- Develop international technical partnership for high explosive test calibration of seismic and infrasound elements of international monitoring stations.			
- Develop and flight-certify a modular prototype using advanced materials and techniques to collect and detect gaseous radionuclide signatures of evasive nuclear testing.			
- Develop long-term, optimal, integrated and operational solutions to detect, collect, and analyze gas and radionuclide signatures of nuclear testing.			
- Develop prototype cosmic-ray muon imaging solution for standoff detection of nuclear warheads in storage or deployed on strategic launch and delivery systems that could lead to adoption of this technology for verification of future Strategic Arms Reduction Treaties.			
- Validate alternate signatures of nuclear weapons testing and develop measurement techniques.			
- Evaluate advanced methods to better integrate the collection, detection, and analysis of low-yield or evasive nuclear weapons testing signatures.			
- Provide technical support for implementation and compliance with the Open Skies Treaty.			
- Develop infrastructure and capability for iterative testing, refinement, and integration of national monitoring capabilities.			
- Test and evaluate prototype version of the Knowledge Management Strategic Information System software for future Strategic Arms Reduction Treaty and other treaty database and notification needs.			
- Enhance the on-site inspection system and virtual training tool with additional operational scenarios for nuclear materials production monitoring in support of the Fissile Material Cutoff Treaty and the Army nuclear disablement/elimination mission.			
- Stand up National Monitoring and Verification test-bed ensemble for iterative tool and method testing and refinement.			
FY 2017 Plans:			
- Complete initial operational assessment of advanced prompt diagnostics for ground-based sensor prototype systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** *RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Complete plans and carry out associated acquisition activities for the transition of advanced prompt diagnostics sensor prototype systems to the US Prompt Diagnostics System. - Demonstrate advanced technologies for the collection of alternative nuclear detonation signatures, such as electromagnetic pulse and transient ionospheric disturbances, to detect and locate clandestine nuclear testing. - Demonstrate advanced technologies for cosmic ray, muon-excited remote counting of nuclear warheads in delivery vehicles and in storage, supporting treaty monitoring and verification. - Develop, test and demonstrate a portable ground-based sensor prototype for post-detonation prompt diagnostics under DISCREET OCULUS. - Develop, test and demonstrate enhanced prototype technologies for prompt diagnostics, debris collection, data analysis, debris diagnostics, and technical capability modeling to support nuclear device reconstruction and attribution, as well as to decrease timeline, lower uncertainty, and increase confidence in technical nuclear forensics conclusions supporting attribution. - Develop, test and demonstrate enhanced prototype technologies to support validation and verification processes and capabilities in order to decrease timeline, lower uncertainty, and increase confidence in technical nuclear forensics conclusions supporting attribution. - Develop, evaluate and demonstrate surrogate debris materials used in validation and verification technologies and in field and fixed laboratory analytic processes. - Develop advanced radionuclide gas collection technologies in support of counterproliferation and compliance verification for the Non-Proliferation Treaty and the Comprehensive Test Ban Treaty. - Develop advanced technologies to detect and monitor for low-yield nuclear tests, including novel techniques for collecting and observing material emissions and source region seismic signatures. - Continue to develop new prompt diagnostic technologies to improve sensor portability, with emphasis on size, weight and power consumption reduction, and on expanded operational capability. - Prepare and conduct an interagency technology demonstration of end-to-end nuclear forensics capabilities. - Prepare an international technical demonstration of post-detonation nuclear forensics research and development capabilities. - Coordinate with partner nations to improve global US nuclear forensics and attribution capabilities, under appropriate international agreements. - Integrate nuclear threat analysis algorithms into existing systems to test and evaluate their effectiveness in reducing processing time. - Demonstrate, test, and field systems to remotely monitor small and wide areas which may produce or contain nuclear threats. - Design and fabricate prototype passive detection systems for determining the location and signature of nuclear material and test and characterize developmental prototype passive detection systems. - Transition near-term technologies to generate prototypes and design packages that will assist operational users. - Conduct advanced/operational testing and evaluation of radiation detection systems to assess their performance.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** *RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Develop and build a new high resolution detector with reduced weight and improved form factors that can be concealed in container consistent with the operational environment. - Integrate new cellular technology into the R/N search network to ensure rapid flow of data from detectors. - Test and evaluate the integration of high resolution detectors with lower resolution detectors to determine the potential to meet threshold R/N detection requirements.			
Accomplishments/Planned Programs Subtotals	63.115	38.427	38.540

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *WMD Defeat Technologies*	31.403	9.356	10.008	-	10.008	10.274	10.505	10.717	10.933	Continuing	Continuing
• 121/0605000BR: *WMD Defeat Capabilities*	6.667	7.156	4.568	-	4.568	9.092	8.714	7.782	7.938	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 the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RG / *Defeat Technologies*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
RG: *Defeat Technologies*	65.774	29.293	22.489	20.710	-	20.710	22.355	22.752	23.227	23.707	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Defeat Technologies project 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. 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.

The decrease from FY 2015 to FY 2016 is due to the relative effect of the increased investment in FY 2015 as a result of the Congressional Add for Technology Solutions Supporting Operations in Subterranean Environments. This investment was realigned during FY 2015 from Project RE-Counter-Terrorism Technologies to better reflect the nature of the investment. The decrease from FY 2016 to FY 2017 is due to decreased investment in next generation CWMD technologies to balance other priorities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RG: Defeat Technologies	21.293	22.489	20.710
Description: Project RG develops advanced technologies and weapon concepts and validates their applicability to CWMD.			
FY 2015 Accomplishments: - Continued to develop access denial or denial-of-use technologies for WMD targets. - Initiated Next Generation CWMD weapon design. - Initiated sub-scale lethality tests for Next Generation Agent Defeat weapon. - Continued work on functional defeat test-bed with initial test events.			
FY 2016 Plans: - Manufacture initial Next Generation CWMD weapon components and sub-systems and conduct sub-system and initial full scale static test. - Continue development of access denial or denial-of-use technologies for CWMD applications.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RG / *Defeat Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Continue functional defeat system development and testing. - Conduct Modular Autonomous CWMD System (MACS) follow-on incremental component/system demonstration. - Conduct functional defeat system demonstration. - Transition initial MACS concept to Military Services/Combatant Commanders. - Develop and integrate MACS Family of System Enabling Technologies. - Plan MACS Family of Systems component demonstration. - Mature diagnostic capability to meet emerging needs and field improved capabilities for agent defeat. - Initiate Heated and Mobile Munitions Employing Rockets (HAMMER) Subsystem Test. - Complete HAMMER Weapon Design. ***FY 2017 Plans:*** - Conduct static tests of full-scale HAMMER weapon system and initiate preparation for full-scale dynamic tests in FY 2018. - Conduct static demonstration of initial capability of access denial and denial-of-use technologies against WMD representative targets. - Initiate Agent Defeat Penetrator weapon system design effort. - Initiate access denial weapon concept design effort. - Continue to develop and integrate classified component and system designs. Prepare to conduct initial demonstrations. - Continue to develop and test functional defeat system. - Continue to develop and test diagnostic capability to meet emerging needs for agent defeat.			
Accomplishments/Planned Programs Subtotals	21.293	22.489	20.710

	FY 2015	FY 2016
Congressional Add: Technology Solutions Supporting Operations in Subterranean Environments	8.000	-
FY 2015 Accomplishments: - Formed IPTs and finalized requirements definition in preparation for FY 2016 prototype development and planned demonstrations. - Demonstrated the ability of robotic air and ground platforms to independently collect and deliver data to a collaborative platform to characterize a subterranean environment. - Developed prototype communications package to enable robust, reliable communications in the subterranean environment.		
Congressional Adds Subtotals	8.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RG / *Defeat Technologies*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *WMD Defeat Technologies*	12.955	11.769	11.304	-	11.304	11.601	11.864	12.103	12.345	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 the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RI / *Nuclear Survivability*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
RI: *Nuclear Survivability*	32.580	5.328	6.191	6.561	-	6.561	6.658	6.738	6.863	7.002	Continuing	Continuing

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 nanoelectronics effort develops and integrates radiation-hardened, high-performance prototype nanoelectronics to meet DoD space and strategic system requirements. The Human Survivability 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.

The increase from FY 2015 to FY 2016 is due to increased investment in Nuclear Surety. The increase from FY 2016 to FY 2017 is due to increased investment in radiation hardened nanoelectronics and nuclear weapons stockpile logistics.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RI: Nuclear Survivability	5.328	6.191	6.561
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 2015 Accomplishments: - Initiated development of Satellite Protection Standard. - Continued research, development, test, and evaluation on physical security technologies designed to enhance protection of the nuclear stockpile as determined by the Services. - Initiated development for the next generation of Defense Integration and Management of Nuclear Data Services (DIAMONDS) network and infrastructure design, leveraging information technology (IT) improvements, to modernize DIAMONDS software code; conducted preliminary design review.			
FY 2016 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RI / *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Publish Satellite Protection Standard. - Address 1,000 written atomic veteran claim responses. - Plan and execute Mighty Guardian XVIII force-on-force test to evaluate nuclear security policy at the Navy's Strategic Weapons Facility Pacific, Naval Base Kitsap, WA. - Continue the development of the next generation of DIAMONDS network and infrastructure design. - Leverage IT improvements and recommendations from industry/Agency. - Modernize DIAMONDS software code with design reviews and meetings with users for future needs/requirements. - Field test-bed system at select user sites and continue to evaluate system. ***FY 2017 Plans:*** - Produce technical reports to address DoD concerns for radiogenic disease related to potential ionizing radiation exposure. - Fabricate Pathfinder & Product Demonstration Vehicle to support technology transfer from (6.2) Applied Research to the United States Air Force/Space & Missile Center and National Reconnaissance Office, for maturation in their Productization & Qualification program in 6.4 Advanced Component Development and Prototypes.			
Accomplishments/Planned Programs Subtotals	5.328	6.191	6.561

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *WMD Defeat Technologies*	20.671	29.383	34.051	-	34.051	34.553	35.261	35.978	36.698	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 the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	Project (Number/Name) RL / *Nuclear & Radiological Effects*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
RL: *Nuclear & Radiological Effects*	-	0.000	0.000	3.528	-	3.528	1.582	1.617	1.658	1.691	Continuing	Continuing

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. Note: This is a new funding line established to rapidly transition capabilities to programs of record.

The increase from FY 2016 to FY 2017 is due to the transition of nuclear effects modeling applied research efforts to advanced technology development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RL: Nuclear and Radiological Effects	0.000	0.000	3.528
Description: Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Plans:*** - Develop nuclear weapon effects tools specifically designed for transition to military targeting systems. - Develop nuclear weapon effects tools specifically designed to support nuclear survivability and standards formulation.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	3.528

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RL / *Nuclear & Radiological Effects*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *WMD Defeat Technologies*	31.666	22.698	28.668	-	28.668	31.146	31.829	32.467	33.120	Continuing	Continuing
• *121/0605000BR: *WMD Defeat Technologies*	-	-	-	-	-	-	-	-	-		

Remarks

See prior year funds related to this this project in program element number 0605000BR.

D. Acquisition Strategy

N/A

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
RM: *WMD Counterforce Technologies*	104.036	27.099	20.717	23.138	-	23.138	26.057	24.939	24.299	24.721	Continuing	Continuing

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 two core research efforts in this project. 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. 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.

The decrease from FY 2015 to FY 2016 is due to the realignment of funding for Technical Reachback from Project RM to Project RA-Information Sciences and Applications. The increase from FY 2016 to FY 2017 is due to increased investment in WMD reconnaissance technology and weapons effects and planning tools.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RM: WMD Counterforce Technologies	27.099	20.717	23.138
Description: Project RM provides: (1) full-scale testing of CWMD weapon effects, weapon effects modeling, and weapon delivery system optimization; and (2) WMD sensor, surveillance, and data processing technologies.			
FY 2015 Accomplishments: - Developed parallel version of transport and dispersion code to allow faster analysis execution on high performance computing resources. Coupled with FY 2014 enhancements, provided upgraded capability to run faster, finer, and larger analyses. - Developed and integrated agent based modeling capabilities. - Conducted a demonstration of scintillating transformational material for CWMD application within an operational architecture. - Supported U.S. Army Program Manager (PM) Unmanned Arial System in completing WMD Aerial Collection System transition activities, fielding, and procurement. - Designed, integrated, and demonstrated Chemical, Biological, Radiological, Nuclear (CBRN) Air-Droppable, Remotely Deployed Sensor (CARDS) payload captive carry system for CARDS packages. - Conducted a CARDS system demonstration of precision emplacement using representative CBRN sensor packages. - Conducted Phase I demonstration of enhanced near-term bio-search/detection sensors for Department of Defense (DoD) and Intelligence Community customers. - Conducted down-select of multi-mode sensor systems for bio-terrorism threat detection. - Initiated Phase II development of select sensor systems for use in detecting small-scale biological labs.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Delivered the Vulnerability Assessment and Protection Option (VAPO) planning tool with improved infrastructure modeling capabilities, including secondary effects from improved vehicle borne improvised explosive device models and tertiary effects linked with social behavior resulting from WMD insult. - Delivered capabilities developed in FY 2014 (Integrated Munitions Effectiveness Assessment (IMEA) 11.1). - Developed Enhanced Tunnel/ Hard and Deeply Buried Targets defeat modeling capabilities in the areas of High Strength Concrete weapon penetration and Steep Slope cratering/rubble model. - Initiated development of non-kinetic weapons effects and full-spectrum defeat capability. - Developed improved Agent Defeat modeling capabilities for WMD target attack planning. - Delivered Targeting/Weaponeering academics and targeting recommendation packages supporting Combatant Command requirements.			
FY 2016 Plans: - Transition initial biological search technologies (Bio-ISR Spiral 1) to DoD and Interagency end-users. - Continue technology development for enhanced area search, localization, and point detection/ identification tools for biological threats of interest (Spiral 2). - Initiate planning for Bio-ISR Spiral 2 demonstration of improved biological search technologies. - Demonstrate unmanned platform capable of high-altitude/long-range glide, vertical takeoff and landing transition and egress for covert emplacement of CBRN payloads/sensors. - Design, develop, integrate, and test computer vision, autonomous navigation on unmanned systems to enable precise CBRN payload emplacement. - Complete WMD Aerial Collection System transition activities, fielding, and procurement. - Deliver agent defeat modeling capabilities (Human Injury, Dynamic Pressure, and Structural Response) for DTRA's Reachback mission. - Utilize high performance computing capabilities to enhance scalable model fidelity. - Enhance software development architecture for more efficient integration of modeling and simulation capabilities into planning tools. - Deliver prototype 64-bit version of counter WMD modeling and simulation planning tools for analysis of large data sets. - Continue to develop improved agent defeat modeling capabilities for WMD target attack planning. - Deliver Targeting/Weaponeering academics and targeting recommendation packages for Combatant Commands. - Develop and demonstrate a low-visibility sensor/detection device for chemical search missions. - Demonstrate nano-material based sensor/reporting system for detection of biological/chemical threats. - Conduct prototype demonstration of scintillating transformational material for CWMD application.			
FY 2017 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Demonstrate proof of concept for next-generation chemical warfare agent detector. - Demonstrate enhanced WMD sample collection system for low-visibility search operations. - Demonstrate Biological Intelligence Surveillance and Reconnaissance (Bio-ISR) Spiral 2 enhanced area search sensors/ capabilities for counter-bio search missions. - Integrate, test and demonstrate CBRN defeat technologies in a remotely-operated unmanned payload. - Test and validate the Vertical Take-off and Landing Autonomous Precision Emplacement System delivering chemical, biological, radiological and nuclear defeat payloads. - Transition enhanced structural response and WMD agent dispersion/neutralization models, using new software architecture for improved WMD vulnerability assessment and force protection planning capabilities. - Transition final prototype of advanced area search sensor to counter biological warfare threats. - Complete phase one of three new software architecture developments, allowing WMD defeat modeling and simulation planning tools (i.e., IMEA) to enhance integration with partner agency tools. - Publish targeting/weaponeering academics and targeting recommendation packages for Combatant Commands.			
Accomplishments/Planned Programs Subtotals	27.099	20.717	23.138

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *WMD Defeat Technologies*	12.750	13.295	12.097	-	12.097	12.375	12.814	13.060	13.323	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 the DoD and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	Project (Number/Name) **RR / *Countering WMD Test and Evaluation*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
**RR: *Countering WMD Test and Evaluation*	1.902	12.150	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

**Project RR title changes from Combating WMD Test and Evaluation to Countering WMD Test and Evaluation beginning in FY 2017.

A. Mission Description and Budget Item Justification

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 2015	FY 2016	FY 2017
Title: RR: Countering WMD Test and Evaluation	12.150	-	-
Description: Project RR provides a unique national test bed capability for simulated WMD facility characterization, weapon-target interaction, and WMD facility defeat testing. ***FY 2015 Accomplishments:*** - Completed improvements at the Technical Evaluation Assessment and Monitor Site (TEAMS) on Kirtland AFB, NM enhancing the security and protection of Special Nuclear Materials at that location. - Performed architectural and engineering (A&E) study that resulted in a 10 year growth plan for TEAMS that will support mission programs. - Provided government/contractor test team support and test data acquisition systems support to classified program at Nevada National Security Site (NNSS), NV. - Upgraded the electrical system at Drift 06 NNSS, NV. - Initiated test infrastructure development effort at NNSS, NV to support a new DoD high-priority test-bed, to include A&E for studies for Drift 07/08 and test support facilities and completion of upgrade to Drift 06.			
Accomplishments/Planned Programs Subtotals	12.150	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** **RR / *Countering WMD Test and Evaluation*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• 20/0602718BR: *Defeat Technologies*	10.277	11.062	13.666	-	13.666	13.978	14.038	14.518	14.864	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency			Date: February 2016
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	Project (Number/Name) RT / *Target Assessment Technologies*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
RT: *Target Assessment Technologies*	145.588	45.572	56.065	41.794	-	41.794	25.550	26.248	26.779	27.327	Continuing	Continuing

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 and to (2) assess in real time the results of physical and functional defeat operations (such as a direct attack). These novel, dynamic capabilities enable Combatant Commands and the intelligence community (IC) to hold at risk high value targets possessed by adversaries.

The increase from FY 2015 to FY 2016 reflects the continuing investment in the development and integration of high-priority find, characterize and assess sensor technologies and supporting algorithms and software. The decrease from FY 2016 to FY 2017 is due to the projected completion of the development and integration of high-priority find, characterize, and assess sensor technologies and supporting algorithms and software.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: RT: Target Assessment Technologies	45.572	56.065	41.794
Description: Project RT provides Combatant Commands 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 2015 Accomplishments: - Delivered Find, Characterize, and Assess detection and characterization on-node data fusion algorithm improvements in support of near-real time target update capabilities. - Delivered Find, Characterize, and Assess Underground Targeting and Analysis System (UTAS) tool suite interface improvement for near real time support of IC target characterization and assessment. - Developed Adversarial Route Analysis Tool with Global Expansion for support of Counter-WMD (CWMD) intelligence analysis. - Developed Full Operational Capability (FOC) for UTAS thermal process modeling capability in support of IC target analysis. - Developed Find, Characterize, and Assess detection and characterization hardware and software to support near-real time target update capabilities.			
FY 2016 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RT / *Target Assessment Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Develop, and demonstrate Nuclear WMD Defeat Model for support of IC CWMD analysis and functional defeat targeting. - Develop and demonstrate Chemical–Biological Weapons Emerging Threats Model capability for support of IC CWMD analysis and course of action selection. - Demonstrate FOC for UTAS thermal process modeling capability for support of IC functional vulnerability analysis of hard or deeply buried WMD related targets. - Demonstrate sensor detection hardware and characterization software integration to support IC near-real time target characterization updates for time critical targeting of WMD related targets. - Conduct developmental demonstration and testing of Spiral 1 prototype sensor nodes in a realistic mission-representative environment. - Conduct Spiral 1 operational assessment of deployable sensor nodes in a realistic mission-representative environment with operational personnel in accordance with the designed concept of operations. - Deliver 24 Spiral 1 prototype deployable sensor units. - Develop new and enhanced (range/sensitivity) detection capabilities and enhanced delivery capabilities as Spiral 2 of the deployable sensor project. - Produce additional prototype sensor units for follow-on (Spiral 2) integration testing and algorithm validation. ***FY 2017 Plans:*** - Demonstrate range and sensitivity detection capabilities and enhanced delivery system for a deployable remote ground sensor. - Conduct integration testing and algorithm validation of a deployable prototype ground sensor. - Integrate deployable ground sensor data outputs into Dynamic Characterization Modeling Tools to support time-dependent target analysis. - Develop processes and approaches for characterization of Underground Facility (UGF) "Pattern of Life" based upon multiple modalities of data input. - Develop analytical processes for planning Functional Defeat of UGFs based on "Pattern of Life" analysis and near-real-time information updates. - Continue to develop WMD complex process models into target facility characterizations. - Continue to develop geo-technical soil and rock models for use in target characterization and sensor deployment planning.			
Accomplishments/Planned Programs Subtotals	45.572	56.065	41.794

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2017 Defense Threat Reduction Agency		Date: February 2016
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention, and Defeat*	**Project (Number/Name)** RT / *Target Assessment Technologies*

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 the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in US Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

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