Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Defense Threat Reduction Agency											Date: February 2015	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*							
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
Total Program Element	533.226	151.669	151.443	155.415	-	155.415	160.701	162.605	166.110	169.427	Continuing	Continuing
RA: *Information Sciences and Applications*	112.074	21.879	28.785	29.949	-	29.949	32.901	32.365	32.780	33.433	Continuing	Continuing
RD: *Detection Technologies*	0.000	-	-	26.401	-	26.401	26.893	27.430	28.039	28.600	Continuing	Continuing
RE: *Counter-Terrorism Technologies*	5.016	1.698	-	-	-	-	-	-	-	-	Continuing	Continuing
RF: *Forensics Technologies*	130.610	34.595	35.061	9.547	-	9.547	10.128	10.443	10.684	10.899	Continuing	Continuing
RG: *Defeat Technologies*	47.857	14.270	10.982	11.769	-	11.769	11.395	11.700	11.965	12.203	Continuing	Continuing
RI: *Nuclear Survivability*	57.264	20.351	19.416	29.988	-	29.988	30.264	30.826	31.592	32.224	Continuing	Continuing
RL: *Nuclear & Radiological Effects*	67.069	31.754	32.352	23.053	-	23.053	23.769	23.899	24.308	24.794	Continuing	Continuing
RM: *WMD Counterforce Technologies*	52.370	14.660	13.787	13.526	-	13.526	13.642	13.958	14.427	14.714	Continuing	Continuing
RR: *Combating WMD Test and Evaluation*	40.575	11.543	11.060	11.182	-	11.182	11.709	11.984	12.315	12.560	Continuing	Continuing
RU: *Fundamental Research for Combating WMD*	20.391	0.919	-	-	-	-	-	-	-	-	-	21.310

Note

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

A. Mission Description and Budget Item Justification

The mission of the Defense Threat Reduction Agency (DTRA) is to safeguard the United States and its allies from global weapons of mass destruction (WMD) threats by integrating, synchronizing, and providing responsive expertise, technologies, and capabilities. This mission directly aligns with several national and Department of Defense (DoD) level guidance/vision documents. For Research, Development, Test & Evaluation (RDT&E), these documents include the National Security Strategy, Defense Strategic Guidance (Sustaining U.S. Global Leadership: Priorities for 21st Century Defense), 2014 Quadrennial Defense Review, National Strategy for Combating Terrorism, 2014 DoD Strategy for Countering WMD, National Strategy to Combat WMD, Defense Planning Guidance, Guidance for Employment of the Force, 2006 National Military Strategy for Combating WMD, National Military Strategic Plan for the War on Terrorism, and Joint Strategic Capabilities Plan (including the Nuclear Annex). To achieve this mission, DTRA has established strategies and tasks to meet their principal objectives. These objectives are: 1) Ensure a safe, secure, and effective nuclear deterrent; 2) Anticipate emerging WMD threats; 3) Provide Combating WMD situational awareness; 4) Assess infrastructure and personnel

vulnerabilities; 5) Prevent proliferation and use of WMD; 6) Defend against WMD threats; 7) Defeat WMD threats; 8) Recover from WMD consequences; and 9) Synchronize countering WMD activities.

A focused and strong WMD threat reduction technology base is critical to meeting these objectives. This technology base is closely tied with the operational support programs that make up DTRA's combat support mission. DTRA's has taken the steps to develop this technology base and provide a foundation for transformational activities within the WMD arena.

Activities funded by Program Element 0602718BR implement a wide set of National Security Presidential Directive 17 and emerging Presidential Policy Directive guidance for prevention of proliferation of WMD and WMD terrorism. Projects support the prevention and adversary use of WMD through the development of technology to locate and identify nuclear threats, post-detonation forensics, and treaty verification. Through development of new sensor systems, sensor networks, counterforce and fundamental Counter-WMD (CWMD) research, these programs contribute to securing and interdicting WMD, WMD delivery systems, and related materials. Finally, programs in this area fund the development of tools for the DTRA Technical Reachback analysis center which supports United States and allied forces, interagency, and civil authorities with 24 hour/7 days per week Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) event analysis support.

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	156.111	151.737	154.537	-	154.537
Current President's Budget	151.669	151.443	155.415	-	155.415
Total Adjustments	-4.442	-0.294	0.878	-	0.878
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.442	-			
• Realignments	-	-	0.878	-	0.878
• FFRDC	-	-0.294	-	-	-

Change Summary Explanation

The increase in FY 2016 from the previous President's Budget submission is due to realignments for increased investment in advanced analytics and effects modeling.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency											Date: February 2015	
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*				Project (Number/Name) RA / *Information Sciences and Applications*			
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
RA: *Information Sciences and Applications*	112.074	21.879	28.785	29.949	-	29.949	32.901	32.365	32.780	33.433	Continuing	Continuing

A. Mission Description and Budget Item Justification

The RA project provides (1) advanced data analytics, knowledge management, and systems engineering support across all other projects, (2) innovative counterproliferation Research & Development (R&D), (3) Technical Reachback support on weapons of mass destruction (WMD) effects and consequences, (4) collaborative Counter WMD (CWMD) analysis capabilities between Department of Defense (DoD) and key interagency and international partners through a globally accessible net-centric framework, and (5) other research activities that benefit the public through analysis and engagement to reduce and counter the threats posed by WMD via the Project on Advanced Systems and Concepts for Countering WMD at the Naval Postgraduate School. The advanced analytics program provides systems engineering and R&D with requirements, technology, architecture analyses, and proof-of-principle capabilities necessary for making decisions on strategic planning, R&D investments, new initiatives, cooperation, ventures with new customers, and accomplishment of high-level, short notice special projects. The innovative counterproliferation effort conducts R&D to investigate, identify, develop, and transition short term, high payoff technologies from the DTRA, other government agencies, industry, academia, and international Science and Technology (S&T) partners into DTRA's, and others R&D programs, and to end user organizations. The Technical Reachback effort provides 24 hour/7 days per week information and analyses on potential impacts of WMD events to warfighters and first responders in consult with the DTRA's CWMD R&D subject matter experts. Net-centric modeling access and support provides a real-time accessible framework which enables DTRA's Chemical, Biological, Radiological, and Nuclear (CBRN) Modeling & Simulation codes to provide an integrated suite of CWMD decision support capabilities. This project also provides support to international CWMD S&T cooperation including the development of modifications and improvements to new technologies and information tools suitable for foreign release and cooperative efforts. Other research activities via analysis and engagement include collaborating with scientific, technical, and social science faculty/experts to help understand and anticipate future WMD capabilities. This effort also provides management and support of the Threat Reduction Advisory Committee which provides independent expert advice to the Secretary of Defense on CWMD.

The increase from FY 2014 to FY 2015 is due to increased investment in advanced analytics, modeling and simulation (M&S), and hazardous effects characterization while reducing investment in systems engineering collaboration with external partners/customers. The increase from FY 2015 to FY 2016 is due to increased investment in advanced analytics and M&S.

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2014**	**FY 2015**	**FY 2016**
Title: RA: Information Sciences and Applications	21.879	28.785	29.949
Description: Project RA develops innovative technologies and modeling and simulation capabilities; collaborative net-centric Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) modeling access and support capabilities between DoD and key interagency and international partners; provides Technical Reachback support for the United States and our allies through improved situational understanding across the complete CWMD mission space; and funds research activities			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
that benefit the public through analysis and engagement to reduce and counter the threats posed by WMD via the Project on Advanced Systems and Concepts for Countering WMD (PASCC) at the Naval Postgraduate School (NPS). ***FY 2014 Accomplishments:*** - Continued to solicit innovative research projects for developing new technologies and increased end-user capabilities to support "Data to Decisions" S&T development. - Provided Open Innovation and Technology Watch/Scouting in support of "Data to Decisions" S&T development for the DoD and other government agencies. - Via NPS/PASCC with support from National Defense University (NDU), completed 23 projects in five broad mission areas. This entailed global analyses of nuclear decision making, preventing escalation during nuclear wars, missile deterrence, non-proliferation, attribution marking for chemical and biological weapons use, and understanding the biological weapons convention. This further entailed eight international strategic dialogues in WMD with partners from Europe, the Middle East, South Asia, Russia, China and Singapore. - Supported the Next Generation Nuclear Scholars (NGNS) initiative through four engagements that provided scholars with invaluable insight and discourse on a myriad of nuclear issues. - Provided strategic advice and management oversight of logistics and operations for the Threat Reduction Advisory Committee. Conducted four full plenary/full committee sessions in 2014, augmented by 18 prepatory groups. This include priorities approved by the Undersecretary of Defense for Acquisition, Technology and Logistics in Global Health Security, Nuclear Strategic Stability, structure of the Chemical, Biological Defense Program, strategic guidance for the stand-up of the new WMD early, indications and warning capability (Constellation Program), and integral strategic advice pertaining to the destruction of chemical weapons and precursor chemicals in the Levant Region. - Continued requirements and gap analyses to enable R&D efforts to meet CWMD capability gaps. - Continued development on next generation capabilities for "real-time" reachback supporting radiological search and visualization; tested mesh network of hand-held radios to support radiation sensor data fusion during the 2014 Boston Marathon. - Delivered initial smartphone based simulation training system to enable teams to practice for radiological search missions without requiring deployment of real radiological sources and sensors. - Continued modifications and capability improvements to vulnerability assessment software and integrated WMD toolsets to contribute to new CWMD cooperative technology efforts. - Continued activities to implement Full Operational Capability for Mission Domain Information Technology architecture. - Made improvements to the DTRA Integration, Test and Experimentation Center. - Provided systems engineering support to numerous DTRA R&D programs, projects, and activities, to include nuclear detection activities, innovative new technologies, modeling and simulation activities, and R&D strategic planning efforts. - Continued to upgrade and manage the R&D portfolio management software tool for use across all DTRA R&D programs, projects, and activities.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Developed and modernized a Global Knowledge Management Capability (GKMC) (subsequently integrated into the Constellation Program) software tool for Office of the Secretary of Defense (OSD) level and other users.			
FY 2015 Plans: - Create automated methods to operate DoD/Department of Homeland Security (DHS)/Department of Energy (DOE) radiation particle transport code suite on the DoD high performance computational network. - Integrate first principle blast and nuclear fallout codes into the DoD/DHS/DOE radiation particle transport code suite. - Deploy the Constellation software tool for OSD level and other users, providing an integrated unclassified CWMD collaboration environment supporting U.S. and Allied capabilities and CWMD situational awareness. - Develop and deploy enhanced geospatial and synthetic population services supporting more rapid Consequence of Execution and Consequence Management predictive modeling and Reachback support. - Support the DTRA exploratory development and initial real-time collaborative CBRNE integrated deployment framework. - Implement the FY 2014 developed design for a common information science and deployment environment, supporting training, operations, and mission support of CBRNE assessment for primary, secondary, and tertiary effects. - Conduct strategic analyses and assessments on emerging WMD threats using various strategic research methodologies. - Continue to manage and support the Threat Reduction Advisory Committee. - Conduct activities in support of leveraging cloud capabilities and demonstrate prototype capabilities. - Demonstrate initial information technology (IT) capabilities in support of achieving highly automated fusion and dissemination of comprehensive data necessary for providing global combating weapons of mass destruction situational awareness.			
FY 2016 Plans: - Participate in an interagency, large-scale testing series of dense gas release. Analyze data and develop models to improve atmospheric hazard predictions to enhance consequence management decision support. - Develop environmental degradation parameters of airborne chemical agents to better characterize collateral effects after a strike on a WMD facility. - In support of the United States Strategic Command (USSTRATCOM), develop capabilities to support analysis of higher order effects, such as infrastructure and economic impacts, from nuclear targeting. - Develop high fidelity Force-on-Force (phenomenology and effects) computational modeling and simulation capabilities integrated with real and virtual sensor responses. - Leverage commercial graphical processor technologies to enable near real-time high fidelity radiation transport calculations. - Integrate new first principle high fidelity blast and nuclear fallout codes into the DoD/DHS/DOE radiation particle transport code suite. - Deploy automated methods to consolidate multiple geospatial terrain types into a single virtual globe capable of supporting multiple modeling and simulation platforms. - Build a CWMD sensor framework with the Night Vision Laboratory to enable real-time data fusion of deployed sensors with modeling and simulation tools.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Deploy mobile device-based situational awareness, mission planning, and training tools for the warfighter featuring up-to-date capabilities for route planning, force tracking, and geo-tagging items of interest. - Deploy and support implementation of faster than real-time analysis code with large scale exercises in support of nuclear physical security threat and vulnerability assessments. - Develop high fidelity radiation detection trainer technologies utilizing mobile devices and augmented reality displays to enable training with virtual radiation source surrogates. - Sponsor and co-lead CBRNE topics as part of the Defense Advanced Research Projects Agency's XData and similar cloud computing challenges supporting the development of new data awareness and large scale anomaly detection capabilities. - Develop CWMD-Situational Awareness and data analysis/anomaly detection technology as part of a DoD Distributed Common Ground/Surface System and Intelligence Community Information Technology Enterprise compliant architectures. - Support advanced topics research including CWMD object-based intelligence, computational reasoning, and knowledge management tool development and testing. - Support research on integration of unclassified and open source data into tools and capabilities supporting "long view" shaping of the CBRNE environment prior to direct integration done in collaboration with the Department of State and Combating Terrorism Technical Support Office. - Support the cross-DTRA Advanced Analytics Hard Problem Research Team which coordinates analytic science activities across the Agency. - Support the rapid development of secure software and toolsets through code vulnerability analysis. - Continue activities in support of leveraging evolving Department and commercial cloud capabilities and services. - Continue to develop and mature IT capabilities in support of achieving highly automated fusion and dissemination of comprehensive data necessary for providing global combating weapons of mass destruction situational awareness. - Continue to conduct strategic analyses and assessments on emerging WMD threats using various strategic research methodologies. - Bring scientific, technical, and social science faculty/experts together and to look into the future and help understand and anticipate WMD capabilities and the technology needed to combat those capabilities. - Continue to manage and support the Threat Reduction Advisory Committee.			
Accomplishments/Planned Programs Subtotals	21.879	28.785	29.949

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation, Prevention, and Defeat*	0.107	-	12.244	-	12.244	11.501	11.397	12.839	13.085	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RA / *Information Sciences and Applications*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 151/0605502BR: *Small Business Innovation Research*	9.700	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assess government, academic, and industrial performers and make selections based upon a "best fit for task" criteria. Common government awardees include DoD Service Laboratories and Department of Energy National Laboratories. For efforts associated with the Project on Advanced Systems and Concepts for Countering WMD/ Naval Postgraduate School, DTRA utilizes an annual, competitive Broad Agency Announcement to select the best WMD research topics and engagements.

E. Performance Metrics

Number of customer requests for data analysis compared to historical level.
Number of changes to investments based on systems engineering analyses.
Number of exercises and operations supported.
Number of Defense Acquisition Workforce Improvement Act certified systems engineers.
New capabilities delivered and transitioned to operational capabilities.
Mission Enclave computing environment moves from development to Initial Operational Capability (IOC).
Mission Enclave moves from IOC to Full Operational Capability.
Segment architectures for the Mission Enclave and supported mission systems.
Integrated segment architectures into the DTRA Enterprise Architecture.
Development of network modeling and system-in-the-loop testing capabilities within the DTRA Integration, Test and Experimentation Center.
Timely delivery of updated DTRA WMD force-on-force and radiation particle transport code to the development team and external customers
Number of project agreements/interactions with foreign partners and Allies.
Number of users of Advanced Analytics tools deployed through the Advanced Analytics Program.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*	Project (Number/Name) RD / *Detection Technologies*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
RD: *Detection Technologies*	-	-	-	26.401	-	26.401	26.893	27.430	28.039	28.600	Continuing	Continuing

Note

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

A. Mission Description and Budget Item Justification

The detection mission is to conduct Research, Development, Test, & Evaluation (RDT&E) to 1) identify, develop, and exploit signatures associated with nuclear threat enablers such as nuclear expertise, financing, or unique materials to advance U.S. capabilities to detect and interdict such threats; and 2) locate, identify, and track special nuclear material and improve detection factors such as range, time, sensitivity, or accuracy to enhance Service/Special Mission Unit capabilities. These efforts support Department of Defense (DoD) requirements for combating terrorism, counter/nonproliferation, and homeland defense.

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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: RD: Detection Technologies	-	-	26.401
Description: Conducts RDT&E to detect, locate, identify, track, and interdict nuclear and radiological threats, which include weapons, material, and enablers to acquisition and development such as nuclear expertise, financing, or unique technologies. These efforts support DoD requirements for combating terrorism, counter/nonproliferation, and homeland defense.			
FY 2016 Plans: - Discover/identify nuclear threat signatures, characteristics, and corresponding detection modalities and collection systems. - Develop algorithms/tools for rapidly and effectively analyzing all-source intelligence to identify nuclear threats. - Prototype systems to remotely monitor small and wide areas which may produce or contain nuclear threats. - Develop algorithms/tools to synthesize the collection and analysis of multiple nuclear threat signatures to improve assessment confidence and cuing of potential nuclear threat events. - Execute robust and operationally relevant testing and evaluation of developmental radiation detection systems to determine and select the best performing technologies and techniques for further development and transition to user groups. - Downselect sensor materials for the most effective/efficient capability and integrate into detection systems. - Downselect detection system algorithms for most effective/efficient processing and integrate into detection systems to improve user capabilities. - Research and develop 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. - Investigate viability of ultra-low-power, long-duration programmable remote radiation monitoring systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RD / *Detection Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Investigate organic semiconductors and photo-detectors to improve detection system performance.			
Accomplishments/Planned Programs Subtotals	-	-	26.401

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation, Prevention, and Defeat*	-	-	29.893	-	29.893	29.689	30.137	30.832	31.447	Continuing	Continuing

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Identification of three nuclear threat signatures that can be operationalized/exploited.
Transition of two algorithms/tools to the analyst community for testing and evaluation.
Delivery of neutron detection testing campaign final report.
Final military utility assessment of active interrogation testing.
Disposition of active interrogation test and evaluation equipment/infrastructure.
Delivery of modeling results for a classified detection system for prototype development.
Delivery of high-resolution focal plane for incorporation into three-dimensional gamma imaging to increase detector sensitivity.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*	Project (Number/Name) RE / *Counter-Terrorism Technologies*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
RE: *Counter-Terrorism Technologies*	5.016	1.698	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter-Terrorism Technologies project is an over-arching project that develops and transitions a full spectrum of new technologies to counter emergent Weapons of Mass Destruction (WMD) thus enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, nuclear production, storage, and weaponization facilities. See paragraph C. for other program funding.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: RE: Counter-Terrorism Technologies	1.698	-	-
Description: Project RE provides R&D support to Joint U.S. Military Forces, specifically USSOCOM, in the areas of Explosive Ordnance Disposal (EOD) Device Defeat; Counter WMD (CWMD) technologies for warfighters; the USSOCOM Combating WMD – Terrorism Support Program; and oversight of counterproliferation R&D resources sent directly to USSOCOM for warfighter-unique counterproliferation technologies. ***FY 2014 Accomplishments:*** Conducted signatures collection campaign at Nevada National Security Site benefiting seventy interagency participants.			
Accomplishments/Planned Programs Subtotals	1.698	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation, Prevention, and Defeat*	109.679	116.630	104.628	-	104.628	106.132	108.171	110.182	112.388	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Number of technologies developed and delivered, and/or proof of concept, or successful Military Utility Assessments conducted that increase the potential mission success and reduces the number of current gaps in Special Operations Forces capabilities to counter weapons of mass destruction.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency											Date: February 2015	
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*				Project (Number/Name) RF / *Forensics Technologies*			
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
RF: *Forensics Technologies*	130.610	34.595	35.061	9.547	-	9.547	10.128	10.443	10.684	10.899	Continuing	Continuing

Note

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

A. Mission Description and Budget Item Justification

This project supports the attribution process through development, demonstration, and transition of improved post-detonation National Technical Nuclear Forensics (NTNF) capabilities in the areas of materials collection, debris diagnostics, materials analysis, prompt diagnostics, and device reconstruction. Starting in FY 2016, detection-related technologies transition to Project RD (Detection Technologies). Project RF includes Research, Development, Test, & Evaluation (RDT&E) to detect, locate, identify, track, and interdict nuclear and radiological threats. This includes weapons, material, and enablers to their acquisition, and development such as nuclear expertise, financing, or unique technologies. These efforts support Department of Defense (DoD) requirements for combating terrorism, counter/nonproliferation, and homeland defense.

The increase from FY 2014 to FY 2015 is due to increased investments in both nuclear detection Intelligence, Surveillance and Reconnaissance efforts and nuclear forensics. 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 2014	FY 2015	FY 2016
Title: RF: Forensics Technologies	34.595	35.061	9.547
Description: Through FY 2015, Project RF develops technologies, systems and procedures for post detonation nuclear forensics and to detect, locate, identify, track, and interdict nuclear and radiological threats, which include not only weapons and material, but enablers to their acquisition and development such as nuclear expertise, financing, or unique technologies in support of DoD requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements. Beginning FY 2016 Project RF becomes Forensics Technologies, developing technologies, systems, and procedures for post detonation nuclear forensics.			
FY 2014 Accomplishments: - Developed, (accelerated development where appropriate), demonstrated, and fielded (prototype) upgraded technical capabilities for prompt diagnostics (under DISCREET OCULUS and MINIKIN ECHO), debris sample collection, sample analysis, modeling to support nuclear device reconstruction, and forensics data to lower uncertainties/increase confidence and improve timeliness of technical nuclear forensics conclusions. Included development of new debris collection, field analysis concepts, improved in-laboratory timelines, new signature development, improved modeling and simulation capabilities, and other supporting technologies. - Developed methods to rapidly determine post-event nuclear weapon yields and reaction history by investigating alternative prompt nuclear weapons effects, effects on the environment, and developing/fielding prototype capabilities.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Identified all-source nuclear threat signatures, characteristics, and corresponding detection modalities; identified 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. - Developed and improved an advanced algorithm to increase the speed, accuracy, and reliability of isotope identification in fielded hand-held and portable detectors. - Conducted testing and evaluation of a photon Bremsstrahlung capability for active interrogation of Special Nuclear Material (SNM) in order to determine possible military utility. - Researched and developed a new, high resolution gamma-ray imaging and isotope identification prototype. - Researched and developed new detector materials that improve the capability to detect, locate, and identify Special Nuclear Materials. - Developed and demonstrated novel and advanced neutron detection technologies as alternatives to Helium-3-based neutron detectors.			
FY 2015 Plans: - Complete initial development of two neutron detection materials as alternatives to helium-3 neutron detectors - Complete development of room-temperature high-resolution gamma imaging detector electronics and semiconductor materials. - Research and develop new detector materials to improve the capability to detect, locate, and identify Special Nuclear Materials. - Improve the manufacturing readiness level by maturing technologies, designs, and production processes. - Execute robust and operationally relevant testing and evaluation of developmental radiation detection systems in order to determine and select the best performing technologies and techniques for further development and transition to user groups. - Demonstrate and field methods to remotely monitor small and wide areas. - Progress development of advanced three-dimensional imaging technologies for high resolution source characterization and identification to provide new and improved capabilities to detect, locate, and identify threat materials. - Research, develop, test, and evaluate software tools and capabilities to locate and identify the signatures of Special Nuclear Materials on both existing and newly developed hardware platforms. - Enhance algorithms to increase speed and reliability of isotope identification in fielded portable radiation detectors. - Begin testing, evaluation, and selection of best-performing developed software tools and algorithms to improve user capabilities and extend capabilities of existing radiation detection technologies. - Field an advanced detection algorithm to improve capabilities to detect, locate, and identify threat materials. - Continue identifying comprehensive all-source nuclear threat signatures, characteristics, and corresponding detection modalities; continue the identification and development of the proper tipping, queuing, data fusion techniques, and algorithms to enable the rapid and effective accumulation of all-source intelligence on nuclear threat scenarios. - Develop, (accelerate development where appropriate), test, demonstrate, and field prototype ground-based sensor capabilities for post-detonation prompt diagnostics under DISCREET OCULUS.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- 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. ***FY 2016 Plans:*** - Accelerate development and evaluate the propagation of prompt diagnostics phenomenology to support the deployment of ground-based sensor capabilities in three US cities for post-detonation prompt diagnostics under the DISCREET OCULUS program. - Develop, test, and demonstrate 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.			
Accomplishments/Planned Programs Subtotals	34.595	35.061	9.547

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation Prevention and Defeat*	73.919	66.707	38.427	-	38.427	39.725	40.219	41.414	42.242	Continuing	Continuing
• 121/0605000BR: *WMD Defeat Capabilities*	6.867	6.887	7.156	-	7.156	7.340	7.437	7.563	7.715	Continuing	Continuing

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Identification of five nuclear threat signatures for further evaluation.
Delivery of one algorithm fusing new nuclear threat signatures with existing all-source intelligence.
Incorporation of Gamma Detector Response and Analysis Software Algorithms on three additional detectors to improve detection capability.
Bench-top demonstration of digital Polaris viability for potential system integration.
Delivery of solid-state neutron detectors to provide alternate detection capability to end users.
Test and evaluation of two RadCam prototypes to determine feasibility of integrated, dual radiation (both gamma and neutron) detection capability.
Initial military utility assessment of active interrogation testing.
Delivery of boron-loaded plastic scintillators to provide alternate detection capability to end users.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RF / *Forensics Technologies*

Delivery of neutron detection testing campaign initial report.
Successfully test, demonstrate, field, and/or transition prototype nuclear forensics technologies/capabilities to an operational customer.
Down-select of new signatures, surrogate urban debris production routes, and technology requirements for field analysis capabilities.
Successful demonstration of the capability to exfiltrate data to a remote platform.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency										Date: February 2015		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*				Project (Number/Name) RG / *Defeat Technologies*			
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
RG: *Defeat Technologies*	47.857	14.270	10.982	11.769	-	11.769	11.395	11.700	11.965	12.203	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 adversarial use of weapons of mass destruction (WMD) while minimizing collateral effects. Technology development focuses on the physical or functional defeat of (1) chemical, biological, radiological, and nuclear threat materials, (2) an adversary's ability to deliver the same, and (3) the physical and non-physical support networks enabling both. This project achieves its 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 for rapid WMD elimination. This project includes developing specific WMD agent/agent-based process simulants, test infrastructure, and sampling capability required for effective development, testing, and evaluation of next-generation Counter-WMD (CWMD) technologies.

The project places a high priority on understanding, characterizing, and validating potential weapon effects within mathematical confidence as it relates to the unintended release of hazardous threat materials.

The decrease from FY 2014 to FY 2015 is due to reduced investment in next generation CWMD technologies to balance other priorities. The increase from FY 2015 to FY 2016 is due to increased investment in component demonstrations and sub-scale and field testing of WMD defeat and assessment technologies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: RG: Defeat Technologies	14.270	10.982	11.769
Description: Project RG (Defeat Technologies) develops advanced technologies and weapon concepts and validates their applicability as counter WMD weapon systems.			
FY 2014 Accomplishments: - Continued to mature an automated system for the analysis of electronics susceptibility to electromagnetic fields. - Continued classified components testing. - Began classified component design. - Continued testing in support of a WMD agent defeat penetrator bomb development. - Continued development of potential WMD target access denial or denial-of-use technologies. - Continued advanced testing of non-energetic WMD Defeat sub-munitions. - Continued small-scale testing of CWMD payloads. - Continued to explore integration of kinetic and non-kinetic capabilities into single payload for CWMD testing. - Continued testing and demonstrations of payloads capable of neutralizing large amounts of WMD agent. - Continued to catalog the accuracy and precision of WMD sampling equipment used in CWMD testing. - Continued development of a capability to conduct full-scale agent defeat testing with acceptable accuracy and precision.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RG / *Defeat Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Conducted large-scale target testing of functional defeat technologies. ***FY 2015 Plans:*** - Mature classified component testing. - Continue classified integration and component design. - Continue development of access denial and denial-of-use technologies for WMD targets. - Continue development and integration of concepts for exploiting susceptibility of electronics to electromagnetic fields. ***FY 2016 Plans:*** - Conduct static demonstration of initial capability of access denial and denial-of-use technologies against WMD representative targets. - Complete electronics susceptibility to electromagnetic fields algorithm development and characterization testing. - Downselect electromagnetic source and start system development and integration. - Continue classified component/system design and integration and conduct initial demonstrations. - Conduct sub-scale tests to assess capability to accurately measure WMD simulant released in plume.			
Accomplishments/Planned Programs Subtotals	14.270	10.982	11.769

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation, Prevention, and Defeat*	15.861	19.591	22.489	-	22.489	22.986	23.365	23.764	24.238	Continuing	Continuing

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Research and develop potential technologies and mature at least three new capabilities to counter WMD between FY 2016 and FY 2020 to Technology Readiness Level 3/4.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*	Project (Number/Name) RI / *Nuclear Survivability*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
RI: *Nuclear Survivability*	57.264	20.351	19.416	29.988	-	29.988	30.264	30.826	31.592	32.224	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Nuclear Survivability project provides innovative technologies for DoD nuclear and conventional forces, associated control and support systems, and facilities to protect and deter nuclear threats to enable mission-essential functions to continue during and after the onset of hostile action by extremists and rogue states. The Nuclear Survivability project provides electromagnetic pulse (EMP) research and standards, Nuclear Weapons Effects (NWE) experimentation, advanced Radiation Hardened Microelectronics (RHM), and human survivability research. The research from this project supports the 487 mission critical systems identified under DoDI 3150.09, Chemical, Biological, Radiological, and Nuclear (CBRN) Survivability Policy.

DTRA is the DoD designated EMP center of excellence to provide electromagnetic pulse survivability assessments to support national and military operational planning, weapons effects predictions, and national strategic system designs. DTRA publishes nuclear related military standards and handbooks for the strategic and non-strategic warfighters and program offices as the DoD NWE subject matter expert.

The RHM program responds to DoD space and missile system requirements for nanoelectronics and photonics technology to support DoD strategic mission needs. This program develops and demonstrates radiation-hardened, high-performance prototype microelectronics to ensure their availability from both private sector and government organizations. Further, the program develops DoD space and satellite nuclear survivability standards and handbooks that provide engineering level detail and defined metrics for all entities with space asset equities.

Pulsed power and laser-driven NWE simulators are available to validate nuclear survivability requirements for DoD missile and space systems, conduct radiation effects research in materials and electronics, and validate computational models. The Experimental Capabilities Program is working with the National Nuclear Security Administration (NNSA) and the United Kingdom's (UK) Atomic Weapons Establishment to jointly develop new enabling technologies for improved NWE experimentation capabilities for x-rays, gamma rays, and neutrons.

Human survivability conducts research to develop and validate mortality and morbidity models associated with radiological and nuclear weapons effects in urban environments.

The decrease from FY 2014 to FY 2015 is due to reduced investment in nuclear effects simulation/experimentation capability and radiation hardened nanoelectronics. The increase from FY 2015 to FY 2016 is due to the realignment of the system vulnerabilities and assessment activities from Project RL-Nuclear & Radiological Effects to Project RI.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: RI: Nuclear Survivability	20.351	19.416	29.988

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RI / *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Description: Project RI (Nuclear Survivability) provides the capability for DoD nuclear forces and their associated control and support systems and facilities in wartime to avoid, repel, endure, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action. ***FY 2014 Accomplishments:*** - Demonstrated RadHard-by-Design 45nm /32nm technology. - Conducted radiation effects on advanced 14nm technology testing and characterization. - Completed 45nm and 32nm hardness assurance methods for testing and assurance projects. - Transitioned radiation effects modeling and simulation project from planar 45nm / 32nm Electronic Design Automation to 28nm / 14nm Fin-Shaped Field Effect Transistors. - Improved the electron beam test capabilities and expertise of the DTRA West Coast Facility in support of US and UK strategic systems survivability certification. - Demonstrated the Short Pulse Gamma prototype as a new and unique test capability within the West Coast Facility for hardening and validation of military systems without over-dosing to improve the long-term performance of mission critical electronics. - Demonstrated strategic level direct laser blow-off impulse test capability to support material modeling & simulation and to establish a low-cost alternative technology to the development of a new magnetic flyer plate facility for future strategic re-entry systems. - Generated and distributed a Guide to Nuclear Weapons Effects Simulation Facilities and Applications, which documents all of the major NEW test capabilities in the United States. - Developed combined radiation and burn prompt injury models and code including time-dependent clinical parameters for integration into nuclear weapons effects code. - Initiated update of MIL-STD-188-125-1 High-Altitude Electromagnetic Pulse Protection For Ground-Based C4I Facilities Performing Critical, Time-Urgent Missions Part 1 Fixed Facilities. - Completed verification test of Modernization of Enterprise Terminals Hardened Transportable Terminal to MIL-STD-188-125-2. - Completed Consolidated Afloat Network and Enterprise Services Military Standard. - Completed draft MIL-STD-4023 Maritime EMP Standard for surface ships. ***FY 2015 Plans:*** - Collaborate with the UK on EMP research on power grid transformers. - Deliver new warm x-ray (10-50 keV) test capability on the Double-Eagle and ZR simulators, in collaboration with Naval Research Laboratory and Sandia National Laboratories. - Upgrade the Short Pulse Gamma facility within the West Coast Facility for hardening and validation of satellite and stockpile subsystems and components. - Explore and validate new pulsed-power neutron and dust test capabilities. - Complete Program Manager's Handbook for Nuclear Survivability.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RI / *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Publish survivability standards in support of satellite systems, all air domain effects, and source region electromagnetic pulse environment. - Complete 32nm Product Demonstration Vehicle. - Initiate a <22nm Rad Hard-by-Design program. - Initiate development of maskless e-beam lithography. ***FY 2016 Plans:*** - Upgrade electron-beam (cold x-ray) test capability at the DTRA West Coast Facility to allow testing at 2X current capability. - Develop innovative techniques to produce 5X improvement in warm x-ray (10-50 keV) test capability for DTRA Double-Eagle simulator. - Perform a System Generated Electro-Magnetic Pulse radiation effects experiments for 2-D code validation on the National Ignition Facility (NIF). - Publish MIL-STD-4023, High-Altitude Electromagnetic Pulse Protection for Maritime Assets and Comprehensive Atmospheric Nuclear Environment military standards. - Update MIL-STD-188-125-1/2, High-Altitude Electromagnetic Pulse Protection for Fixed and Transportable Facilities and Systems. - Update MIL-HDBK-423 High-Altitude Electromagnetic Pulse Protection for Fixed facilities. - Publish Aircraft High Altitude EMP Protection Handbook. - Conduct electromagnetic pulse assessments on Defense critical infrastructure for electric power and telecommunications networks. - Update cost estimates to harden methodology protocols for aircraft, missile, and satellite systems. - Transition Single Event Transient research and mitigation from legacy to 32 nanoscale technology nodes. - Initiate a RadHard-by-Design development for less than 22nm commercial technology. - Transition maskless e-Beam lithography from Small Business Innovation Research project to trusted Rad Hard Foundry. - Publish Satellite System Nuclear Survivability Protection Military Standard. - Initiate development of Satellite System Nuclear Survivability protection design handbook. - Initiate a low power design using one 1-D gridded design guidelines in a RadHard foundry.			
Accomplishments/Planned Programs Subtotals	20.351	19.416	29.988

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation Prevention and Defeat*	5.939	5.570	6.191	-	6.191	6.640	6.727	6.814	6.942	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RI / *Nuclear Survivability*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Develop advanced x-ray experimental and computational capabilities to meet emerging survivability requirements.
Demonstrate Short Pulse Gamma prototype to support high temporal fidelity for validation of prompt gamma Nuclear Weapons Effects on advanced electronics.
Publish/update Nuclear Weapons Effects survivability standards and protection handbooks
Update cost estimates to harden studies and protocols.
Perform nuclear survivability assessments for Services and Combatant Commands.
Provide advanced hardened nanoelectronics circuits and mitigation techniques.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*	Project (Number/Name) RL / *Nuclear & Radiological Effects*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
RL: *Nuclear & Radiological Effects*	67.069	31.754	32.352	23.053	-	23.053	23.769	23.899	24.308	24.794	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Nuclear and Radiological Effects project develops nuclear and radiological assessment modeling tools to support military operational planning, weapon effects predictions, and strategic system design decisions; consolidate validated Defense Threat Reduction Agency (DTRA) modeling tools into the Joint Information Environment for integrated functionality; predict system response to nuclear and radiological weapons producing electromagnetic, thermal, blast, shock and radiation environments - key systems include Nuclear Command and Control System, Global Information Grid, space assets, structures, humans and environment; provide detailed adversary nuclear infrastructure characterization to enhance counterforce operations and hazard effects; conduct analyses in support of nuclear and radiological science and technology and address the priority needs of the Combatant Commands and the Department of Defense (DoD); and develop foreign nuclear weapon outputs.

The increase from FY 2014 to FY 2015 is due to the net effect of the cancellation of the Experimental Situational Awareness Center, a shift in priorities from weapon effects modeling to electromagnetic pulse modeling, and increased investment in full effects modeling. The decrease from FY 2015 to FY 2016 is due to an administrative realignment of the System Vulnerability and Assessment program to Project RI-Nuclear Survivability due to the nature of that effort.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: RL: Nuclear & Radiological Effects	31.754	32.352	23.053
Description: Project RL (Nuclear & Radiological Effects) develops nuclear and radiological assessment modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions. ***FY 2014 Accomplishments:*** - Started Atmospheric Nuclear Environment Military Standard. - Began Communication in Disturbed Environment Military Standard. - Complete Verification Test of Modernization of Enterprise Terminals Hardened Transportable Terminal to MIL-STD-188-125-2. - Completed draft MIL-STD-4023, High Altitude Electromagnetic Pulse protection for maritime assets. - Via the Nuclear Weapons Effects Network, modeled fire start to support United States Strategic Command (USSTRATCOM) interest in Consequences of Execution, fire start experiments, and tunnel defeat. - Modeled nuclear infra-red effects for global assessment of missile defense systems' capabilities. - Updated radar and infra-red system models. - Updated Source Region Electromagnetic Pulse model to support USSTRATCOM requirements. - Modified input requirements of engineering level codes to take advantage of Redbook and Bluebook output. - Modeled the effects of urban nuclear detonations for underground tunnels (e.g., subways) in support of infrastructure assessments.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RL / *Nuclear & Radiological Effects*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Expanded Nuclear Weapons Effects Database System functionality with additional targets and damage calculations. Enhanced the following: reports, plot rendering, combined and multiple weapons effects, and Nuclear Weapons Database. - Provided model for analysis of the high altitude nuclear environments and the effects of electromagnetic pulse and non-ideal air-blast on defense systems for an integrated net-centric application. ***FY 2015 Plans:*** - Begin transition of improved airblast, fallout, fire and Source Region Electromagnetic Pulse models to the DTRA net-centric environment for USSTRATCOM (and other nuclear targeting/consequences of execution users). - Improve weapon outputs, environment models, and Effects Manual 1 (EM-1) chapters. - Deliver upgraded database of foreign nuclear weapon outputs for DoD and the Services. - Develop System Generated Electromagnetic Pulse simulation codes by adapting physics capabilities of the Maxwell's Equations Equivalent Circuit code and the Improved Concurrent Electromagnetic Particle-In-Cell high performance computing code. - Further develop a database with selected nuclear weapon output and effects for use in validation of nuclear weapon effects codes. - Develop component level electromagnetic pulse response model for better modeling/predictions of effects on electronic systems. - Via the Nuclear Weapon Effects Network, continue modeling economic and social consequences of nuclear detonation effects, collateral building damage due to nuclear-induced airblast, assess nuclear dust/debris effects on airborne systems, and model nuclear fire initiation. - Begin enhancement and fix current shortfalls of High Altitude Radiation Phenomenology functionality for use on modern computer systems. - Complete transfer of contracting vehicle for continued development of nuclear weapon environment on airborne strategic systems at low, medium, and high-altitudes to include non-steady, non-level flight to modernize modeling and simulation tools in airblast, thermal, and fallout applicable areas. - Complete transfer of contracting vehicle for development of the Atmospheric Nuclear Environment Military Standard. - Develop new magnetosphere experiments using microsatellites (CubeSats) for quantification of the artificial radiation belt formation and decay in order to define the source term for damage and degradation of space assets. - Complete transfer of contracting vehicle for development of the Communication in Disturbed Environment Military Standard. - Complete engineering level modeling of the response of airborne systems in nuclear dust clouds, and transition the capability to nuclear hardness databases. - Begin implementation of first principle modeling tools for nuclear fire initiation and spread in urban and suburban environments. - Publish MIL-STD-4023, High Altitude Electromagnetic Pulse Protection for Maritime Assets. - Publish Comprehensive Atmospheric Nuclear Environment MIL-STD. - Update MIL-STD-188-125-1/2, High Altitude Electromagnetic Pulse Protection for Fixed and Transportable Facilities and Systems. - Perform an electromagnetic pulse assessment on a U.S. Navy warship.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RL / *Nuclear & Radiological Effects*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Update MIL-HDBK-423, High Altitude Electromagnetic Pulse protection for fixed facilities. - Publish Aircraft Electromagnetic Pulse Protection Handbook. - Add Source Region Electromagnetic Pulse to the Electromagnetic Reliability and Effects Prediction Toolkit. - Conduct electromagnetic pulse assessments on defense critical infrastructure power, specifically the power grid and telecommunications networks. ***FY 2016 Plans:*** - Deliver airblast, fallout, fire and Source Region Electromagnetic Pulse models to USSTRATCOM (and other nuclear targeting/ consequences of execution users) for improved nuclear targeting using nuclear effects that have not been considered in the past. - Provide improved foreign nuclear weapon outputs, environment models, and Effects Manual 1 (EM-1) chapters. - Develop System Generated Electromagnetic Pulse simulation codes by adapting physics in the Maxwell's Equations Equivalent Circuit code and the Improved Concurrent Electromagnetic Particle-In-Cell high performance computing code. - Further develop a gold standard database with selected historical nuclear weapon output and effects for use in validation of Nuclear Weapons Effects codes. - Via the Nuclear Weapons Effects Network, continue modeling economic and social consequences of nuclear detonation effects, collateral building damage due to nuclear-induced airblast, assess nuclear dust/debris effects on airborne systems, and model nuclear fire initiation, allowing these considerations to be part of the targeting analyses. - Improve high altitude nuclear effects functionality for use in analyzing satellite and missile defense response to a nuclear environment. - Continue implementation of first principle modeling tools for nuclear fire initiation and spread in urban and suburban environments.			
Accomplishments/Planned Programs Subtotals	31.754	32.352	23.053

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 121/0605000BR: *WMD Defeat Capabilities*	5.644	-	-	-	-	-	-	-	-	-	5.644

Remarks

D. Acquisition Strategy

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

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RL / *Nuclear & Radiological Effects*

E. Performance Metrics

Provide DoD the ability to predict the survival and mission impact of military critical systems exposed to nuclear weapon environments within acceptability criteria defined during the model accreditation process.

Continuously improve USSTRATCOM official strategic targeting capability to determine the consequences of execution from nuclear weapons.

Weapon Effects Steering Committee: Coordinate and integrate nuclear weapon effects needs, capabilities, and programs across the United States and United Kingdom defense communities.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*	Project (Number/Name) RM / *WMD Counterforce Technologies*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
RM: *WMD Counterforce Technologies*	52.370	14.660	13.787	13.526	-	13.526	13.642	13.958	14.427	14.714	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Weapons of Mass Destruction (WMD) Counterforce Technologies Project provides applied research to support 1) full and sub-scale testing required to investigate countering WMD weapon effects and sensor performance, 2) weapon effects modeling algorithm development, and 3) development of visualization and situational awareness tools to support the next generation Defense Threat Reduction Agency (DTRA) Technical Reachback analysis cell.

This project provides Combatant Commanders with the prediction capability and the attack options to engage WMD targets. The project conducts weapon effects phenomenology tests, analyzes data, conducts high performance computer simulations, and creates/modifies software to more accurately model and simulate weapons effects on WMD and related targets. These efforts will lead to advanced capabilities in countering WMD planning tools. The Advanced Energetics Program develops new novel energetic materials and weapon design technology for rapid, directed, and enhanced energy release, providing new capability to defeat difficult WMD/Hard and Deeply Buried Targets. The Advanced Energetics Program develops new high energy systems well above current chemical energy levels to defeat WMD targets beyond the reach of traditional high explosive blast/frag warhead technology.

The decrease from FY 2014 to FY 2015 is due to reduced investment in small and medium-scale validation and parametric study experiments for advanced energetics. The decrease from FY 2015 to FY 2016 is due to decreased investment in weapons effects modeling.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: RM: WMD Counterforce Technologies	14.660	13.787	13.526
Description: Project RM (WMD Counterforce Technologies) provides (1) novel and enhanced weapons energetic materials and structures, full-scale testing of counter WMD weapons effects, weapons effects modeling, and weapon delivery optimization, (2) WMD sensor, surveillance and data processing technologies, and (3) the DTRA Experimentation Lab.			
FY 2014 Accomplishments: - Developed Blast Propagation Through Failed Walls Model. - Completed testing to update Agent Release Model for container perforated translation/collision. - Optimized Finite Element Flow Solver for agent defeat calculations in complex tunnels. - Completed General Near Miss Lethality Model. - Continued model development for blast and fragment propagation through failing blast doors and multi-blast doors. - Continued lab and scale testing for validation of high fidelity models for penetration mechanics through ultra-high strength materials. - Developed test data for steel columns for near contact detonations to feed global response models for agent defeat planning and consequence of execution estimation.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Continued global response testing and modeling for progressive collapse analyses for consequence of execution estimation. - Coordinated a new project agreement with Singapore for testing and modeling of mega columns. - Completed a model for blast propagation through bunker walls for inventory weapons. - Performed annual cycle of requirements collection, challenge proposals, resource allocation, and technical support through high performance computing. - Enhanced one high performance computing production code to better leverage capabilities of the Department of Defense (DoD) high performance computers for improved modeling and simulation time to response. - Delivered a 70% increase in high end computational cycles to numerical modeling and simulation community. - Produced scaled quantities of three novel explosives having output performance greater than conventional explosives. - Initiated effort to produce greater scaled quantity of novel explosive material for performance testing. - Invented four new polymers with better performance than existing energetic polymers for potential counter-WMD technology applications. - Filed patent application for two polymers which have photovoltaic properties with potential counter-WMD technology applications. - Discovered and employed methods for production of energetic polymers. - Completed standardization of sensitivity test methods. - Conducted a large scale test of hybrid enhanced blast explosives and reactive cases for defeat of biological agents using simulants. - Scaled up synthesis of novel explosives, prepared their metalized composites, and conducted field tests. - Developed real-time reachback requirements and gap solutions through wide area search Table Top Exercise.			
FY 2015 Plans: - Develop Hybrid Enhanced Blast Explosives; demonstrate ability to embed detonator system and disperse along with the fuel to initiate cloud reaction as designed. - Conduct a large-scale test of Hybrid Enhanced Blast Explosives and reactive cases for defeat of biological agents using simulants. - Modeling and test support to optimize and improve reactive case technology for use in Joint Multi-Effects Warhead System, Tube-launched, Optically-tracked, Wireless-guided bunker buster, and Hellfire warheads. - Conduct field tests to support optimization and improve effectiveness of biocidal effect fuels used in explosive formulations, innovative common data methods supporting advanced WMD effects modeling and simulation capabilities for consequence management. - Conduct lab and field tests of two new high explosive formulations for use in Conventional Prompt Global Strike warheads: one optimized for blast/fragmented, one optimized for high speed penetration warheads.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Improve hydrocodes to provide high fidelity capability to model post-detonation energy release from non-ideal detonation and other new advanced energetics systems. - Integrate weapons effects model for blast propagation through bunker walls for inventory weapons into planning tools. - Develop weapons effects debris model from bunker walls subjected to internal detonations with inventory weapons. - Complete testing of response of dry-agent stimulant in container undergoing perforation, translation, and collision from weapons induced loads. Deliver new Agent Release Model. - Begin large-scale testing for validation of high fidelity models for penetration mechanics through ultra-high strength materials. - Complete testing and begin model development for response of massive columns to near-contact charges. - Conduct testing to validate high fidelity computational methods for predicting progressive collapse analysis of steel buildings. - Perform annual cycle of requirements collection, challenge proposals, resource allocation, and technical support through high performance computing. - Submit proposal(s) to the DoD High Performance Computing Modernization Program (HPCMP) to fund dedicated high performance computing hardware to meet unique DTRA requirements. - Submit proposal(s) to the HPCMP to fund software development to meet unique DTRA requirements.			
FY 2016 Plans: - Complete technology gap analysis for chemical/biological source term modeling. - Enhance computational fluid and structure codes for chemical/biological source term modeling. - Conduct component level, small-scale testing for chemical/biological source term modeling. - Develop fast running engineering models for dispersion of chemical/biological agents. - Test modeling of response of mega columns to near-contact charges. - Perform annual cycle of requirements collection, frontier proposals, resource allocation, and technical support through high performance computing. - Develop/demonstrate small-scale Hybrid Enhanced Blast Explosives. - Test/demonstrate Hybrid Enhanced Blast Explosives and reactive cases for simulated biological agent defeat. - Model and test reactive case technologies for Joint Multi-Effects Warhead System and various warheads. - Improve modeling capability for weapon post detonation reaction using reactive case technologies. - Improve modeling capability for agent defeat using novel weapon energetic payloads. - Conduct field tests to support optimization and improve effectiveness of explosive formulations for chemical, biological, radiological, and nuclear agent defeat. - Conduct lab and field tests of two new explosive formulations tailored (temperature, pressure and outgases) for WMD defeat operations.			
Accomplishments/Planned Programs Subtotals	14.660	13.787	13.526

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation, Prevention, and Defeat*	29.644	29.346	20.717	-	20.717	22.846	23.216	23.739	24.212	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assess government, academic, and industrial performers and make selections based upon a "best fit for task" criteria. Common government awardees include DoD Service Laboratories and Department of Energy National Laboratories, and specialized university laboratories. Technologies are transitioned to users via Service and Interagency Program Management Offices (e.g., WMD Aerial Collection System transitioned via the Army's Program Manager Unmanned Aircraft System, Counter WMD Planning Tools via Joint Munitions Effectiveness Manual Weaponeering System and Target Acquisition Workstation, and other modeling and simulation capabilities are transitioned via DTRA Technical Reachback.

E. Performance Metrics

Delivery of optimized Finite Element Flow Solver for agent defeat calculations in complex tunnels.
Submittal of high performance computing annual cycle of requirements collection, challenge proposals, if any, and provide technical support.
Completion and integration of one enhanced high performance computing production code to better leverage capabilities of DoD high performance computers for improved modeling and simulation time to response.
Completion of lab and scale testing for validation of high fidelity models for penetration mechanics through ultra-high strength materials.
Delivery of test data for steel columns for near-contact detonations to feed global response models for agent defeat planning and consequence of execution estimation.
Completion of global response testing and modeling for progressive collapse analyses for consequence of execution estimation.
Completion of a model for blast propagation through bunker walls for inventory weapons.
Completion of a large scale test of Hybrid Enhanced Blast Explosives and reactive cases for defeat of biological agents using simulants.
Completion of synthesis of novel explosives, prepare their metalized composites and complete field tests.
Completion of modeling and testing support to optimize and improve reactive case technology for use in Joint Multi-Effects Warhead System, Tube-launched, Optically-tracked, Wireless-guided bunker buster, and Hellfire warheads.
Completion of testing of response of dry-agent stimulant in container undergoing perforation, translation, and collision from weapons induced loads.
Delivery of new Agent Release Model.
Completion of large-scale testing for validation of high fidelity models for penetration mechanics through ultra-high strength materials.
Completion of testing and begin model development for response of massive columns to near-contract charges.
Completion of testing to validate high fidelity computational methods for predicting progressive collapse analysis of steel buildings.
Delivery of technology gap analysis for chemical/biological source term modeling.
Completion of computational fluid and structure codes and component level, small-scale testing for chemical/biological source term modeling.
Completion of testing for and development of fast running engineering model for dispersion of chemical/biological agents.
Completion of demonstration of Hybridized Enhance Blast Explosive and reactive cases for simulated biological agent defeat.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

Completion of tests for reactive case technologies for Joint Multi-Effects Warhead System and various warheads.
Delivery of modeling capability for weapon post detonation reaction using reactive case technologies.
Completion of lab and field tests of two new explosive formulations tailored (temperature, pressure, and outgases) for WMD defeat operations.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*	Project (Number/Name) RR / *Combating WMD Test and Evaluation*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
RR: *Combating WMD Test and Evaluation*	40.575	11.543	11.060	11.182	-	11.182	11.709	11.984	12.315	12.560	Continuing	Continuing

Note

RR Project title changed from Test Infrastructure to Combating WMD Test and Evaluation starting in FY 2015.

A. Mission Description and Budget Item Justification

The Combating Weapons of Mass Destruction (WMD) Test and Evaluation Project provides a unique national test bed capability for simulated 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 United States military or civilian systems and targets. It leverages 50 years of testing expertise to investigate weapons effects and target response across the spectrum of hostile environments that could be created by proliferate nations or terrorist organizations with access to advanced conventional weapons or WMD (nuclear, biological, and chemical). The project provides capabilities that support the testing requirements of warfighters, other government agencies, and friendly foreign countries. It creates testing strategies and a WMD Test Bed infrastructure focusing on the structural response of buildings and Hard and Deeply Buried Targets that house nuclear, biological, and chemical facilities. It provides support for full and sub-scale tests that focus on weapon-target interaction with fixed soft and hardened facilities to include above ground facilities, cut-and-cover facilities, and deep underground tunnels. This capability does not exist anywhere else within the DoD and supports the counterproliferation pillar of the National Strategy to Combat WMD.

The decrease from FY 2014 to FY 2015 is due to the cancellation of the Infrastructure Development and Improvement program to balance priorities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: RR: Combating WMD Test and Evaluation	11.543	11.060	11.182
Description: Project RR provides a unique national test bed capability for simulated 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 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.			
FY 2014 Accomplishments: - Continued Combating WMD (CWMD) testing/demonstration at Nevada National Security Site to defeat credible and threat-based scenarios; continued with transition into several related projects/planned events through FY 2017. - Supported development and demonstration of TransAtlantic Collaboration Biological Resiliency Demo, a DoD capability to shape interagency approach to counter a wide area biological event impacting U.S. and partner nations' key civilian/military infrastructure.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RR / *Combating WMD Test and Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Continued research of biological re-aerosolization in conjunction with DoD/Department of Homeland Security (DHS)/ Environmental Protection Agency (EPA) to help develop precise measurement technologies for residual biological pathogens reentering air after settling. - Continued intergovernmental Biological Agent Defeat test program between DTRA and Defence Research and Development Canada. - Conducted testing in support of Treaty Verification Technology Program and Source Physics Experiment to support Comprehensive Test Ban Treaty initiatives, New START warhead verification, and detection and verification of biological and chemical weapons. - Continued testing Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking targets used for WMD activities. - Continued environmental remediation and compliance activities at the Nevada National Security Site, White Sands Missile Range, and Kirtland Air Force Base (AFB) in accordance with EPA, safety, and environmental guidelines. Deferred major demolition and restoration efforts of major test articles while ensuring they are safely closed and sealed at acceptable standards. - Maintained current inventory of infrastructure and instrumentation, extending the life-cycle of these items as long as possible to ensure test beds meet customers' advanced technology testing needs.			
FY 2015 Plans: - Continue CWMD testing/demonstration at Nevada National Security Site to defeat credible and threat-based scenarios; continue with transition into several related projects/planned events through FY 2017. - Continue technical and testing development and demonstration of TransAtlantic Collaboration Biological Resiliency Demo, a DoD capability to shape interagency approach to counter a wide area biological event impacting U.S. and partner nations' key civilian/military infrastructure. - Continue testing in support of "Speed of Sound" nuclear forensic program estimated to continue through FY 2015. - Support revitalized Weapons Effects Phenomenology Program supporting DTRA test programs. - Continue testing in support of Treaty Verification Technology Program and Source Physics Experiment to support Comprehensive Test Ban Treaty initiatives, New START warhead verification, and detection and verification of biological and chemical weapons. - Continue support of WMD sensor testing at the Technical Evaluation Assessment and Monitor Site to detect and prevent nuclear grade material from entering the United States, U.S. territories, and Allied Nations through air, rail, and ship ports. - Continue testing CBRNE sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking targets used for WMD activities. - Continue nuclear detection and forensics testing to prevent weapons grade material/dirty bombs from entering the United States, U.S. territories, and Allied Nations.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RR / *Combating WMD Test and Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
- Continue environmental remediation and compliance activities at the Nevada National Security Site, White Sands Missile Range, and Kirkland AFB in accordance with EPA, safety, and environmental guidelines. Defer major demolition and restoration efforts of major test articles while ensuring they are safely closed and sealed at acceptable standards. - Maintain current inventory of infrastructure and instrumentation, extending life-cycle of these items as long as possible to ensure test beds meet customers' advanced technology testing needs. - Document, prioritize, and support test infrastructure requirements. ***FY 2016 Plans:*** - Begin testing at Nevada National Security Site in support of the nonproliferation portion of the National Center for Nuclear Security portfolio. - Conduct CWMD testing/demonstration at Nevada National Security Site to defeat credible and threat-based scenarios with transition into several related projects/planned events. - Continue technical and testing development/support of Transatlantic Collaborative Biological Resiliency Demonstration, a DoD capability to shape interagency approach to counter a wide area biological event impacting U.S. and partner nations' key civilian/ military infrastructure. - Perform testing in support of Treaty Verification Technology Program and Source Physics Experiment to support Comprehensive Test Ban Treaty initiatives. - Continue support of WMD sensor testing at the Technical Evaluation Assessment and Monitor Site to detect and prevent nuclear grade material from entering the United States, U.S. territories, and Allied Nations through air, rail, and ship ports. - Test CBRNE sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking targets used for WMD activities. - Conduct environmental remediation and compliance activities at the Nevada National Security Site, White Sands Missile Range, and Kirtland AFB in accordance with EPA, safety, and environmental guidelines. Secure major demolition and restoration efforts of major test articles while ensuring they are safely closed and sealed at acceptable standards. - Maintain current inventory of infrastructure and instrumentation, extending life-cycle of these items as long as possible, to ensure test beds meet customers' advanced technology testing needs. - Document, prioritize, and support test infrastructure requirements. - Conduct collection campaigns with interagency participation specific to relevant counter WMD data collection requirements.			
Accomplishments/Planned Programs Subtotals	11.543	11.060	11.182

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation, Prevention, and Defeat*	0.092	-	-	-	-	-	-	-	-	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RR / *Combating WMD Test and Evaluation*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Number of tests executed safely, (i.e., no personal injury and no unintentional significant damage of property)
Number of tests that are evaluated and completed in accordance with scheduled milestones.
Number of tests that undergo environmental assessment consistent with existing Environmental Impact Statements. All tests executed undergo environmental review consistent with existing Environmental Impact Statements.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency			Date: February 2015
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *WMD Defeat Technologies*	Project (Number/Name) RU / *Fundamental Research for Combating WMD*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
RU: *Fundamental Research for Combating WMD*	20.391	0.919	-	-	-	-	-	-	-	-	-	21.310

A. Mission Description and Budget Item Justification

The Fundamental Research for Combating Weapons of Mass Destruction (CWMD) project conducts technology reviews of the Defense Threat Reduction Agency's (DTRA's) Basic Research Program to identify promising emerging science with potential to be matured into CWMD technologies. The advancement of technology and science into applied technology development efforts focuses upon increasing the stability and utility of mid-to-long term, moderate risk but high payoff science, and emerging technologies for transition to other DTRA applied technology programs. This effort serves as the bridge between the bench scientist and the applied technologist.

The decrease from FY 2014 to FY 2015 is due to the completion of the University Strategic Partnership activities with the University of New Mexico and Pennsylvania State University.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: RU: Fundamental Research for Combating WMD	0.919	-	-
Description: This project provides (1) strategic studies to support the Department of Defense (DoD), (2) decision support tools and analysis to support CWMD research and development investments, and (3) early applied research for technology development. ***FY 2014 Accomplishments:*** - Provided technical and programmatic support to DTRA's basic research program.			
Accomplishments/Planned Programs Subtotals	0.919	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• 1/0601000BR: *DTRA Basic Research Initiative*	44.783	37.778	38.436	-	38.436	38.783	39.463	40.134	40.937	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2016 Defense Threat Reduction Agency		Date: February 2015
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *WMD Defeat Technologies*	**Project (Number/Name)** RU / *Fundamental Research for Combating WMD*

D. Acquisition Strategy

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

E. Performance Metrics

Project performance is measured via a combination of statistics including the number of publications generated, number of students trained in sciences and engineering supporting DoD's educational goals, number of research organizations participating, and the percentage of participating universities on the U.S. News & World Report "Best Colleges" list.

Additional performance indicators include the publication of an annual basic research technical and external programmatic review report.

Each study/project will commence within three months of customer's requests and results delivered within three months of completion.