Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Defense Threat Reduction Agency										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*				R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	218.761	212.742	196.954	-	196.954	191.786	191.547	195.336	198.406	Continuing	Continuing
RA: *Systems Engineering and Innovation*	49.387	53.464	42.112	-	42.112	41.379	40.652	41.600	41.440	Continuing	Continuing
RE: *Counter-Terrorism Technologies*	9.277	-	-	-	-	-	-	-	-	Continuing	Continuing
RF: *Detection Technology*	40.556	52.649	50.548	-	50.548	48.248	48.614	49.926	50.894	Continuing	Continuing
RG: *Advanced Energetics & Counter WMD Weapons*	29.431	29.139	17.115	-	17.115	14.825	14.935	13.786	13.718	Continuing	Continuing
RI: *Nuclear Survivability*	22.048	17.902	17.503	-	17.503	17.261	17.388	17.855	18.718	Continuing	Continuing
RL: *Nuclear & Radiological Effects*	21.813	16.776	25.343	-	25.343	23.922	23.968	25.202	25.620	Continuing	Continuing
RM: *WMD Battle Management*	15.239	10.899	13.761	-	13.761	18.569	16.366	17.288	17.693	Continuing	Continuing
RR: *Test Infrastructure*	16.648	21.528	21.941	-	21.941	19.517	21.870	22.149	22.740	Continuing	Continuing
RT: *Target Assessment Technologies*	0.486	-	-	-	-	-	-	-	-	Continuing	Continuing
RU: *Fundamental Research for Combating WMD*	13.876	10.385	8.631	-	8.631	8.065	7.754	7.530	7.583	Continuing	Continuing

A. Mission Description and Budget Item Justification

The mission of the Defense Threat Reduction Agency (DTRA) is to safeguard America and its allies from Weapons of Mass Destruction (WMD) by reducing the present threat and preparing for the future threat. This mission directly reflects several national and Department of Defense level guidance/vision documents to include the National Security Strategy, Unified Command Plan, National Strategy to Combat WMD, Counterproliferation Interdiction, National Strategy for Combating Terrorism, National Military Strategy, Global Development of Forces, Global Employment of Forces, National Military Strategy for Combating WMD, National Military Strategic Plan for the War on Terrorism, Joint Strategic Capabilities Plan (including the Nuclear Annex), and Nuclear Posture Review. To achieve this mission, DTRA has identified principal objectives along with strategies and tasks to ensure the objectives are met. Three of these objectives are to deter the use of WMD, reduce the present threat, and to prepare for the future threat. A focused and strong threat reduction technology base is critical to achieving these objectives and is closely tied with the operational support programs that make up its combat support mission. DTRA has taken the steps to develop this technology base and provide a foundation for transformational activities within the WMD arena.

Project RA provides systems engineering and analysis support across all other Projects, innovative counterproliferation research, and technical advisory reachback support on Weapons of Mass Destruction (WMD) effects and consequences.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Defense Threat Reduction Agency	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*

Project RE provides initial funding for the Joint Intelligence Preparation of the Operational Environment (JIPOE) process to forecast plausible terrorist WMD threats for planning and conducting operations to combat WMD terrorism. Follow-on funding for this project can be found in the Proliferation Prevention and Defeat; 0603160BR, budget exhibit.

Project RF develops technologies, systems and procedures to detect, identify, track, tag, locate, monitor and interdict strategic and improvised nuclear and radiological weapons, components, or materials in support of Department of Defense (DoD) requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements.

Project RG develops advanced technologies and weapon concepts and validates their applicability as counter Weapons of Mass Destruction (WMD) weapon systems.

Project RI provides the capability for DoD nuclear forces and their associated control and support systems and facilities in wartime to avoid, repel, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action. Funding in this project reflects a rebalancing of efforts within the program element to augment the Radiation Hardened Microelectronics Program and enabling technologies to enhance Nuclear Weapons Effects (NWE) experimentation capability.

Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapon effects predictions, and strategic system design decisions.

Project RM provides (1) full scale testing of counter WMD weapon effects, sensor performance, and weapon delivery optimization, (2) weapon effects modeling, and (3) the Defense Threat Reduction Agency Experimentation Lab.

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 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.

Project RT provides the Combatant Commands and the Intelligence Community with technologies and processes to find and characterize hard and deeply buried targets and then assess the results of attacks against those targets.

Project RU provides (1) strategic studies to support DoD, (2) Decision support tools and analysis to support combating WMD research and development investments, and (3) early applied research for technology development.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Defense Threat Reduction Agency	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	**R-1 ITEM NOMENCLATURE** PE 0602718BR: *WMD Defeat Technologies*

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	221.185	212.742	206.170	-	206.170
Current President's Budget	218.761	212.742	196.954	-	196.954
Total Adjustments	-2.424	-	-9.216	-	-9.216
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-0.329	-			
• SBIR/STTR Transfer	-3.695	-			
• MisDirected Congressional Add (FY10-21IR)	1.600	-	-	-	-
• Realignment / Directed Efficiencies	-	-	-8.367	-	-8.367
• Inflation Reduction	-	-	-0.849	-	-0.849

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Project: RM: *WMD Battle Management*		
Congressional Add: *National Center for Blast Mitigation & Protection*	1.200	-
Congressional Add Subtotals for Project: RM	1.200	-
Project: RU: *Fundamental Research for Combating WMD*		
Congressional Add: *University Strategic Partnership*	1.920	-
Congressional Add: *Center for Nonproliferation Studies – Monterey Institute*	1.600	-
Congressional Add Subtotals for Project: RU	3.520	-
Congressional Add Totals for all Projects	4.720	-

Change Summary Explanation

The FY 2010 decrease from the previous President's Budget submission is due to the internal SBIR reprogramming and the FY 10-11PA reprogramming action in support of higher priority Department needs.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Defense Threat Reduction Agency	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*

The FY 2012 decrease is predominately attributed to the net effect of a Departmental direction for increased efficiency in the area of Advisory & Assistance Services and other contractual services, an increased investment to build international partner capacity to combat weapons of mass destruction, and a realignment of 0603160BR funds to 0602718BR to better reflect the nature of the Radiation Hardened (RadHard) Microelectronics efforts in the RI-Nuclear Survivability budget project. RadHard efforts are developmental and involve the transition of promising basic research outputs into solutions for broadly defined military needs, short of major development projects, with a view towards development and evaluation of technical feasibility. Additionally, there is an increased investment and consolidation of key nuclear weapons effects functions in the Nuclear Weapons Effects Center (NWEC) for first-principles nuclear weapon effects modeling and analysis capability contributing to the National Effects Enterprise.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RA: *Systems Engineering and Innovation*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RA: *Systems Engineering and Innovation*	49.387	53.464	42.112	-	42.112	41.379	40.652	41.600	41.440	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Systems Engineering and Innovation project provides (1) systems engineering and analysis support across all other Projects, (2) innovative counterproliferation research, and (3) technical advisory reachback support on Weapons of Mass Destruction (WMD) effects and consequences. The systems engineering effort provides research and development with requirements, technology, architecture analyses and proof-of-principle capability necessary for making decisions on strategic planning, research and development investments, new initiatives, cooperation, ventures with new customers, and accomplishment of high-level, short notice special projects. It also conducts the development, validation and fielding of the Arms Control Information System as a part of the U.S. commitment under arms control treaties. The innovative counterproliferation effort conducts research and development to investigate, identify, develop and transition short term, high payoff technologies from Defense Threat Reduction Agency (DTRA), other government agencies, industry, academia and international Science and Technology partners into the respective DTRA research and development programs. The technical reachback effort provides 24 hours, 7 days per week information and analyses on potential impacts of a WMD event to Warfighters and First Responders in consult with DTRA's Combating WMD Research and Development subject matter experts. This project also provides technical support to the DTRA London Office.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RA: Systems Engineering and Innovation	49.387	53.464	42.112	-	42.112
Description: Project RA provides the research and development both for systems engineering and analysis support across all other projects and innovative counterproliferation research and technical reachback support. ***FY 2010 Accomplishments:*** - Delivered enhanced CBRNE modeling and simulation (M&S) capability in the Joint Semi-Automated Forces M&S environment. - Conducted requirements and gap analyses to enable research and development efforts to meet combating WMD capability gaps. - Developed an analytic capability to aid in requirements analysis and inform portfolio management system. - Supported program and project managers by translating Agency goals and Concept of Operations into actionable products. - Conducted one CONUS and one OCONUS Maritime Radiological Standoff Identification demonstrations in conjunction with US PACOM, DOE, US Navy, and the Republic of Singapore - Conducted requirements analysis and initiated spiral 1 software development efforts to update the Arms Control Enterprise System (ACES), incorporating requirements specified in the New START Treaty					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RA: *Systems Engineering and Innovation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Fielded a web-based Technology Program Maturity Model (TPMM) tool for program Technology Readiness Levels (TRL) assessments - Initiated operational capability for systems engineering decision support tools. Direct support to Defense Threat Reduction Agency (DTRA) programs and projects for analyzing and determining key performance and key technical parameters to support investment strategies. - Initiated 21st century nuclear threat assessment in support of the Nuclear Posture Review. - Initiated Battle Management Architecture and Manufacturing Readiness Level Assessment studies vis a vis the DTRA mission and active projects. - Initiated Nuclear Enterprise architecture analysis. - Initiated three new systems engineering-based special projects. - Completed and transition innovative projects in portable neutron sources for nuclear detection and radio systems for use in jamming environments. - Completed and transition micro miniature chemical detector for unattended sensors. - Solicited new innovative research projects. - Initiated operational capability for systems engineering decision support tools. Direct support to Defense Threat Reduction Agency (DTRA) programs and projects for analyzing and determining key performance and key technical parameters to support investment strategies. - Continued requirements and gap analyses to enable research and development efforts to meet combating WMD capability gaps. Support program and project managers by translating Agency goals and Concept of Operations into actionable products. - Initiated 21st century nuclear threat assessment in support of the Nuclear Posture Review. - Initiated Battle Management Architecture and Manufacturing Readiness Level Assessment studies vis a vis the DTRA mission and active projects. - Initiated Nuclear Enterprise architecture analysis. - Initiated three new systems engineering-based special projects. - Completed and transitioned innovative projects in portable neutron sources for nuclear detection and radio systems for use in jamming environments. - Completed and transitioned micro miniature chemical detector for unattended sensors. - Solicited new innovative research projects.					
FY 2011 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RA: *Systems Engineering and Innovation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Finalize operational capability for systems engineering decision support tools. Direct support to DTRA programs and projects for analyzing and determining key performance and key technical parameters to support investment strategies. - Continue requirements and gap analyses to enable research and development efforts to meet combating WMD capability gaps. Support program and project managers by translating Agency goals and Concept of Operations into actionable products. - Complete 21st century nuclear threat assessment. - Complete the Distributed Decision Support and Analysis architecture and Manufacturing Readiness Level Assessment studies vis a vis the DTRA Mission and active projects. - Complete Nuclear Enterprise architecture analysis. - Initiate three new systems-engineering based special projects. - Solicit new innovative research projects. - Complete reconstructing the current networks to produce the DTRA Integration Technical Experimentation Center (DITEC) as an environment to test and assess new technologies and configuration changes. - Develop and integrate secure core infrastructure enhancements that remediate vulnerability issues. - Engineer and deploy full virtual infrastructure modeling and anomaly detection capability. ***FY 2012 Base Plans:*** - Develop next generation WMD Analysis Reachback Tool capabilities. - Continue to solicit new innovative research projects. - Solicit at least 5 new innovative research projects focused on Chemical-Biological detection, Countering Weapons of Mass Destruction (CWMD) / Improvised Explosive Device and Special Nuclear Materials detection. - Continue requirements and gap analyses to enable research and development efforts to meet combating WMD capability gaps. Support program and project managers by translating Agency goals and Concept of Operations into actionable products. - Complete initial concept demonstrations for Standoff Detection in the Continental United States (CONUS) and Outside the Continental United States (OCONUS) environments to Combat WMD proliferation - Facilitate Joint Concept Development & Experimentation (JCDE) for the CWMD Community of Interest. - Investigate and explore developmental technologies, such as Virtual Worlds. - Analyze, explore, and identify gaps, and barriers associated with CWMD Warfighter Challenges - Support STRATCOM requirements for an integrated strategic stockpile force structure planning tool. - Support Office of the Secretary of Defense Capability Assessment and Program Evaluation (OSD CAPE) with standoff nuclear detection analysis and modeling.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	**R-1 ITEM NOMENCLATURE** PE 0602718BR: *WMD Defeat Technologies*	**PROJECT** RA: *Systems Engineering and Innovation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Perform analysis studies to predict new WMD threats. - Stimulate, identify, and execute high-impact projects to address long term resolution of WMD issues. - Provide long-range analytical support to the warfighter. - Develop and innovate a Nuclear Weapon-Related Materiel (NWRM) module in Defense Integration and Management of Nuclear Data Services with the ability to evolve to keep up with emerging mainstream technologies to consolidate various Department of Defense (DoD) tracking systems into a single worldwide accountability system that provides the ability to account, maintain, report, and track NWRM during peacetime, crisis, and wartime. - Design and implementation of Mission Domain IT architecture. Includes migration and integration of current R&D IT capabilities leveraged by DTRA operational and combat support customers into the operational IT infrastructure. - Contract support to design, implement and manage the DTRA Integration, Test and Experimentation Center. - Provide capability to model, simulate and analyze existing DTRA systems, networks, enclaves and communications capabilities and perform regression testing for system changes and upgrades (including Information Assurance patches). - Building partner capacity through applied research to improve the security capabilities of our international partners.					
Accomplishments/Planned Programs Subtotals	49.387	53.464	42.112	-	42.112

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation Prevention and Defeat*	8.435	7.270	7.161		7.161	7.826	8.891	9.174	10.028	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Number of customer requests for data analysis compared to historical level.

Number of changes to investments based on systems engineering analyses.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	**R-1 ITEM NOMENCLATURE** PE 0602718BR: *WMD Defeat Technologies*	**PROJECT** RA: *Systems Engineering and Innovation*

Number of exercise and operations supported.

Number of Defense Acquisition Workforce Improvement Act certified systems engineers.

New capabilities delivered and transitioned to operational capabilities.

Manage the strategic weapons stockpile and Nuclear Weapon-Related Materiel; maintain 100% accountability.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RE: *Counter-Terrorism Technologies*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RE: *Counter-Terrorism Technologies*	9.277	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter-Terrorism Technologies project RE is primarily funded in Proliferation Prevention and Defeat, 0603160BR. This FY10 funding kicks off the USSOCOM Counter Weapons of Mass Destruction – Terrorism (CWMD T) Support Program (SCSP) that supports the Joint Intelligence Preparation of the Operational Environment (JIPOE) process to forecast plausible terrorist WMD threats for planning and conducting operations to combat WMD terrorism. The CWMD-T Support Program specifically addresses Commander, USSOCOM responsibilities under the Chairman, Joint Chiefs of Staff (CJCS) Unified Command Plan (UCP) and Concept of Operation Plans (CONPLANS) 7500 and 7520 for integrating and synchronizing Defense–wide operations and activities to prevent terrorists from developing, acquiring, proliferation or using WMD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Project RE: Counter-Terrorism Technologies	9.277	-	-	-	-
Description: Project RE provides initial funding for the Joint Intelligence Preparation of the Operational Environment (JIPOE) process to forecast plausible terrorist WMD threats for planning and conducting operations to combat WMD terrorism. Follow-on funding for this project can be found in the Proliferation Prevention and Defeat; 0603160BR, budget exhibit. ***FY 2010 Accomplishments:*** - Established SCSP Initial Operational Capability. - Integrated and federated national intelligence with operations research systems analysis capabilities to support planning and operations.					
Accomplishments/Planned Programs Subtotals	9.277	-	-	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 28 / 0603160BR: *Proliferation Prevention and Defeat*	59.627	102.395	114.337		114.337	114.657	115.798	115.798	115.964	Continuing	Continuing

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
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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 reduce the number of current gaps in Special Operations Forces (SOF) capabilities to counter weapons of mass destruction when conducting Overseas Contingency Operations.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RF: *Detection Technology*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RF: *Detection Technology*	40.556	52.649	50.548	-	50.548	48.248	48.614	49.926	50.894	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Detection Technology project develops technologies, systems and procedures to detect, identify, track, tag, locate, monitor and interdict strategic and improvised nuclear and radiological weapons, components, or materials in support of Department of Defense requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements. This project researches, develops, demonstrates, and transitions advanced technologies to improve: operational capability to detect and identify nuclear and radiological weapons, and to support the attribution process through improved post-detonation National Technical Nuclear Forensics operational capabilities; and to support the attribution process. Efforts under this project also support international peacekeeping and nonproliferation objectives, on-site and aerial inspections and monitoring, on-site sampling and sample transport, and on-site and off-site analysis to meet forensic, verification, monitoring and confidence-building requirements.

The Detection Technology project under Weapons of Mass Destruction Proliferation Prevention and Defeat emphasizes the advanced technology development and engineering portion of the overall effort.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RF: Detection Technology	40.556	52.649	50.548	-	50.548
Description: Project RF develops technologies, systems and procedures to detect, identify, track, tag, locate, monitor and interdict strategic and improvised nuclear and radiological weapons, components, or materials in support of Department of Defense (DoD) requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements. ***FY 2010 Accomplishments:*** - Continued the extensive effort begun in the standoff Bremsstrahlung active interrogation system Joint Capability Technology Demonstration to develop a standoff active interrogation system to detect hidden and shielded nuclear material. - Performed field demonstrations of new detector technologies for handheld detectors, distributed sensors, and vehicle mountable detector systems, to improve the ability of fielded forces to detect, locate, and identify nuclear materials in the battle space. Continued to improve performance of new detector materials, imaging and spectroscopy systems, and signals analysis methods through rigorous field testing. - Continued development of prototype upgraded technical capabilities for prompt and debris sample collection, sample analysis, and integration of design modeling and forensic data to support development of technical conclusions.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RF: *Detection Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Investigated the use of muon and proton beams for standoff stimulation of fission in nuclear materials. Conducted experiments to validate the feasibility of the approach. ***FY 2011 Plans:*** - Complete development of a fielded standoff active interrogation system for standoff detection and warning of hidden and shielded nuclear material. - Continue development of a baseline DoD large standoff monoenergetic or wakefield accelerator active interrogation system to provide a new reference standard for evaluating progress and capabilities in standoff detection and warning of hidden and shielded nuclear material. - Perform field demonstrations of new detector technologies for handheld detectors, distributed sensors, and vehicle mountable detector systems, to improve the ability of fielded forces to detect, locate, and identify nuclear materials in the battle space. Continue to improve performance of new detector materials, imaging and spectroscopy systems, and signals analysis methods through rigorous field testing. - Continue to develop and field (prototype) upgraded technical capabilities for prompt debris sample collection, sample analysis, and integration of design modeling and forensic data to support development of technical conclusions. - Continue execution of the National Technical Nuclear Forensics Joint Concept Technology Demonstration (JCTD). - Investigate the use of muon and proton beams for standoff stimulation of fission in nuclear materials. Conduct experiments to validate the feasibility of the approach. - Investigate alternative methods to stimulate fissions in nuclear materials from standoff ranges, including the use of high-energy lasers to generate beams of mono-energetic x-rays. - Develop methods to rapidly determine nuclear weapon yields post-event, by investigating alternative prompt nuclear weapons effects on the environment. - Develop improved correlation tools, signature databases, and modeling of device/production design space to increase confidence, decrease uncertainties and timelines, to better support production of consensus technical forensics results. - Transition alternative neutron detection materials and systems as an alternative to the use of helium-3. ***FY 2012 Base Plans:*** - Complete design and fabrication of a prototype passive interrogation system for determining the location of nuclear material.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RF: *Detection Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Complete design of man-portable field instrument capable of passively locating and identifying nuclear materials. - Continue to develop and demonstrate neutron detection technology as an alternative to helium-3 neutron detectors. - Institute development of a rugged, mobile stand-off radiation detection system to provide detection and identification of nuclear materials in a field environment. - Research and develop new detector materials intended to improve the capability to detect, locate, and identify threat materials. Improve the manufacturing readiness level by maturing technologies, designs, and production processes. - Transition compact, high performing replacement electronics for detectors to commercial production. - Develop an advanced algorithm to increase speed and reliability of isotope identification in fielded hand-held and portable detectors. - Investigate viability of an Active Interrogation (AI) system integrated on an Autonomous Underwater Vehicle (AUV). - Continue to develop and field (prototype) upgraded technical capabilities for prompt and debris sample collection, sample analysis, and integration of design modeling and forensic data to support development of technical conclusions. - Complete execution, transition and fielding of the National Technical Nuclear Forensics (NTNF) Joint Concept Technology Demonstration (JCTD) capabilities and begin Limited Operational Use / Employment and Follow-on Sustainment activities - Continue development of a fieldable standoff active interrogation system for standoff detection and warning of hidden and shielded nuclear material. - Continue to perform field demonstrations of new detector technologies for handheld detectors, distributed sensors, and vehicle mountable detector systems, to improve the ability of fielded forces to detect, locate, and identify nuclear materials in the battle space. - Continue to improve performance of new detector materials, imaging and spectroscopy systems, and signals analysis methods through rigorous field testing. - Expand the functionality of the Mobile Field Kit – Radiological (MFK-R) to add radiological situational awareness to the current suite of chemical sensors in the kit. - Investigate alternative methods to stimulate fissions in nuclear materials from standoff ranges, including the use of high-power lasers to generate beams of mono-energetic x-rays.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RF: *Detection Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Investigate the use of muon and proton beams for standoff stimulation of fission in nuclear materials. Conduct experiments to validate the feasibility of the approach. - Progressively advance the laboratory physics demonstrations of target stimulation, signature detection, and validated modeling capability. - Develop a system to produce, capture, steer, cool and re-accelerate negative muons in a reduced footprint and with fewer components than are being used in comparable muon generating systems. - Develop the ability and Concept of Operations (CONOPS) to detect radiation induced air fluorescence from special nuclear material (SNM) by passive and active means. - Investigate concept of a pulsed millimeter wave system which detects radioactive sources in both passive and active interrogation scenarios. - Improve the Monte Carlo N-Particle (MCNP) code to enhance its modeling capability for specific problems. - Continue development of a large standoff, directionally oriented, monoenergetic gamma (e.g. laser Wakefield/ inverse Compton scattering accelerator) source for integration with an active interrogation system.					
Accomplishments/Planned Programs Subtotals	40.556	52.649	50.548	-	50.548

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation Prevention and Defeat*	64.986	90.688	77.784		77.784	76.298	77.863	78.528	80.321	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Successful completion of laboratory testing of the helium dimer Compton imager.

Successful completion of the individual digital dosimeter project.

Increased standoff detection distance using a mobile active interrogation system to stimulate characteristic neutron and gamma ray signals from nuclear material.

Successful acceptance and operational development of transitional detection technologies.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RF: *Detection Technology*

Successful demonstrations of a forensics capability to support attribution involving both Radiological Dispersal and Improvised Nuclear Devices.

Delivery of technical equipment prototypes to reduce their current gaps in technology, to locate, characterize and provide advanced diagnostics to defeat Weapons of Mass Destruction devices in support of a classified Chairman Joint Chiefs of Staff plan.

Improved forensics evaluation tool capabilities.

Support development of National Technical Nuclear Forensics (NTNF) capabilities through development of technologies/prototypes addressing gaps and shortfalls in Department of Defense (DoD) NTNF capabilities, and through participation in the interagency process. Note: Specific metrics associated with NTNF are classified.

Use an active interrogation system to interrogate and differentiate Special Nuclear Materials and an inert material at extended ranges.

Delivery of a series of documents that discuss the technical aspects of land and sea concepts of operations (CONOPS) for detecting radiological and nuclear threats, along with their supporting documents.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RG: *Advanced Energetics & Counter WMD Weapons*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RG: *Advanced Energetics & Counter WMD Weapons*	29.431	29.139	17.115	-	17.115	14.825	14.935	13.786	13.718	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter WMD Weapons & Capabilities project provides applied research supporting defeat of Weapons of Mass Destruction (WMD) targets (including facilities with biological and chemical agents) while minimizing collateral damage and release of those agents when using air, land and sea assets brought to the theater by the warfighters. The effort integrates disruptive payloads and technologies into existing and next generation weapon systems, develops a Hard and Deeply Buried Target (HDBT) Defeat capability against targets in deeply buried facilities and tunnels to provide an over ten times increase in capability to propagate weapon effects in tunnels compared to the current inventory weapons capability by FY 2017 and provides residual and transition support of these products. These objectives will be accomplished by a combination of developing and/or maturing technologies, weapon systems, weapon concepts and methods. Supported products are: (1) advanced counter WMD weapons, fuzing technology, and autonomous systems; (2) agent defeat weapons and methods; and (3) disruptive payloads and delivery systems. The Advanced Energetics & Counter WMD Weapons Program, transferred from RG to RM between FY11 and FY12, develops new novel energetic materials and weapon design technology for rapid, directed and enhanced energy release, providing new capability to defeat difficult WMD/HDB targets. The Advanced Energetics Program also develops new high energy systems well above chemical energy levels to defeat WMD targets beyond the reach of traditional high explosive blast/frag warhead technology.

The decrease from FY 2011 to FY 2012 is predominately due to the transfer of Advanced Energetics effort to RM-Battle Management to properly align organizational responsibilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RG: Advanced Energetics & Counter WMD Weapons	29.431	29.139	17.115	-	17.115
Description: Project RG develops advanced technologies and weapon concepts and validates their applicability as counter Weapons of Mass Destruction (WMD) weapon systems. ***FY 2010 Accomplishments:*** - Completed 1st year of four year joint activity between DTRA and Air Force Research Laboratory (AFRL) focused on survivable penetrator explosive development of transformational energetic material fill with enhanced survivability. - Initiated assessment of kinetic and non-kinetic capabilities into single payload for Counter WMD (CWMD). - Initiated HDBT Countermeasures Program to assess countermeasure effects on current weapons & tactics and identify gaps in defeat capability.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RG: *Advanced Energetics & Counter WMD Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continued development of process modeling capability for non-kinetic based CWMD and apply it to specific CWMD targets. - Developed inventory of survivable data recorders for use in DTRA funded FY10-11 penetration test efforts. - Initiated bulk neutralization research on innovative weapon fill concepts for chemical/biological agent defeat capability. - Demonstrated survivability of fuze booster cup recorder during multiple hard target penetration sled tests. - Continued development of integrated process model for use in DT&E of non-kinetic CWMD capabilities. - Tested first crucial fuze component under static and dynamic harsh environment conditions. - Conducted sub-scale bio defeat testing of enhanced payload concepts (pre-formed fragment and jetting payloads). - Flight tested Battle Damage Information (BDI) system including Micro Air Vehicle (MAV) ejection and video coverage of target site. - Developed an algorithm for improving the capability to conduct DT&E of non-kinetic CWMD capabilities. - Flight tested prototype BDI Link Advanced Demonstrator (BLADE) hardware that transmits pre-impact weapon data. - Developed advanced wireless sensor capability and advanced diagnostic capabilities to meet gaps in DT&E for C-WMD payloads. - Designed infrastructure for long haul communication of BDI data from battlefield back to command centers. - Determined feasibility of combined chem/bio defeat testing. - Conducted detonations in a scaled complex tunnel facility in support of weapon and model development efforts. - Initiated functional defeat biological effects testing. - Conducted four full scale sled tests through multi-story structures to improve weapon penetration and survivability models. - Completed planning and development of representative threat WMD production target. - Supported Hard Target Void Sensing Fuze full-scale Joint Capability Technology Demonstration survivability testing. - Developed test plan for thermal evaluation of the JMEWS warhead. - Evaluated and assessed the Second-order Hydrodynamic Automatic Mesh Refinement Code (SHAMRC) ability to model multi-phase reactive flow, and identification of needed improvements. - Upgraded the SHAMRC code to add an ability to model multiple fuel types and liquid fuels. - Demonstrated tests and characterization experiments of fuel-augmented warhead concept. - Conducted reactive case fragmentation and blast performance tests for novel reactive structural materials.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RG: *Advanced Energetics & Counter WMD Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Conducted performance characterization of highly Aluminized and packet design novel charge designs. - Developed and fabricated new capability to produce and characterize novel molecular-cluster organo-metallic energetic materials. ***FY 2011 Plans:*** - Conduct Scaled High Speed Penetrator Tests versus High Strength Concrete Targets to further characterize breakthrough penetrator technologies. - Incorporate improved material models into penetration codes for geological and concrete targets. - Complete development of fuze/fuze module sub-scale survivability test protocol to further characterize breakthrough penetrator technologies. - Continue maturing advanced non-energetic countering WMD payload components. - Initiate advanced testing of countering WMD sub-munitions. - Explore transformational energetic fills by performing Sub-scale characterization of next generation survivable penetrator energetic material fill. - Demonstrate robust survivable 3” fuze instrumentation weapon data recorder package in sub-scale tests. - Continue Thermite Multi-effort Basic Research, trade studies, tests and Demos. - Initiate Singlet Oxygen Compatibility studies/tests. ***FY 2012 Base Plans:*** - Downselect and qualify enhanced survivable energetic material fill and inert simulate. - Continue maturing advanced non-energetic WMD Defeat payload components. - Conduct subscale experiments to develop and verify prediction capability for countermeasure effects on projectile penetration. - Continue advanced testing of WMD Defeat sub-munitions. - Develop and test fuze well redundant data recorder for field and flight testing of both legacy and developmental hard target defeat weapons. - Initiate testing and demonstrations of Bulk Neutralization Payloads. - Develop a low-cost layer and void sensing target detection device for hard target defeat fuze and transition hardware to a fuze development. - Continue explore transformational energetic fills by performing Sub-scale characterizations of next generation survivable penetrator energetic material fill. - Develop miniature shock survivable fuze and integrate low cost layer and void sensing target detection device hardware.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RG: *Advanced Energetics & Counter WMD Weapons*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continue development of process modeling capability for non-kinetic based CWMD and apply it to specific CWMD targets. - Conduct flight testing of operational BLADE system demonstrating capability to transmit BDI data into long haul communication infrastructure. - Continue to explore integration of kinetic and non-kinetic capabilities into single payload for counter WMD. - Demonstrate entire infrastructure for long haul communication of BDI data from battlefield back to command centers leveraging BDI flight tests. - Initiate testing and demonstrations of non-energetic countering WMD payloads. - Conduct full scale test against target with penetration countermeasures. - Initiate warhead integration of WMD Defeat sub-munitions. - Determine and catalog the accuracy and precision of bio-aerosol sampling equipment utilized in C-WMD testing. - Conduct the investigations necessary to develop a capability to conduct full-scale agent defeat testing with acceptable accuracy and precision. - Complete bio effects testing with insensitive munitions and other High Energy fills for bulk agent defeat. - Continue reduced scale target testing of functional and kinetic defeat. - Initiate testing for BLU-119/B conversion to safer, lower Life Cycle Cost payload fill. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	29.431	29.139	17.115	-	17.115

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation Prevention and Defeat*	16.688	17.386	15.186		15.186	20.631	21.477	21.768	22.442	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Number of large scale tests completed.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	**R-1 ITEM NOMENCLATURE** PE 0602718BR: *WMD Defeat Technologies*	**PROJECT** RG: *Advanced Energetics & Counter WMD Weapons*

Percent increase of countering WMD weapon performance compared to fielded weapons (e.g. Bomb, Live Unit (BLU)-109 and BLU-113).

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RI: *Nuclear Survivability*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RI: *Nuclear Survivability*	22.048	17.902	17.503	-	17.503	17.261	17.388	17.855	18.718	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Nuclear Survivability project provides enabling technologies for Department of Defense (DoD) nuclear forces and their associated control and support systems and facilities in wartime to avoid, repel, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action. Emphasis is on ionizing radiation effects. The Nuclear Survivability project provides Radiation Hardened (RadHard) Microelectronics and Nuclear Weapons Effects (NWE) experimentation research. Funding in this project also supports the expanding role of the Nuclear Test Personnel Review (NTPR) program into Science & Technology development for human survivability.

The NWE simulators are available to validate nuclear survivability requirements for DoD missile and space systems, conduct research in radiation effects, and validate computational models. The Nuclear Survivability Experimental Capabilities program is working with the National Nuclear Security Administration and the United Kingdom Atomic Weapons Establishment to jointly develop new, enabling technologies for improved NWE experimentation capabilities for x-rays, gamma rays and neutrons.

The Nuclear Technology Analysis Support provides support for the Joint Atomic Information Exchange Group (JAIEG) and the international Weapon Effects Steering Committee (WESC) that was called the NWE Users' Group. The WESC establishes standards for U.S. and U.K nuclear weapons effects simulation codes and models as defined and prioritized by the nuclear community, and serves as a forum for sharing information on nuclear technologies, gaps and plans.

The increase from FY 2011 to FY 2012 in this project is due to the net effect of the conversion of 0603160BR funds to 0602718BR funds to better reflect the nature of the RadHard Microelectronics efforts in the RI-Nuclear Survivability budget project. RadHard efforts are applied research and involve the transition of promising basic research outputs into solutions for broadly defined military needs, short of major development projects, with a view towards development and evaluation of technical maturity.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RI: Nuclear Survivability	22.048	17.902	17.503	-	17.503
Description: Project RI provides the capability for DoD nuclear forces and their associated control and support systems and facilities in wartime to avoid, repel, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action. Funding in this project reflects a rebalancing of efforts within the program element to augment the Radiation Hardened Microelectronics Program and enabling technologies to enhance Nuclear Weapons Effects (NWE) experimentation capability.					
FY 2010 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RI: *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continued transition of reflex triode technology for warm X-rays on Saturn machine at Sandia National Laboratories. . - Completed a joint cold x-ray source and effects experiment at the National Ignition Facility (NIF) with Lawrence Livermore National Laboratory and the Missile Defense Agency. - Developed enabling technologies for improved NWE experimentation capabilities for x-rays, gamma rays, and neutrons. - Developed modeling for prompt radiation environment in urban settings, noting in particular canyon effects and shielding by structures. - Initiated short pulse gamma project to develop a compact, high fidelity source for dose rate testing. ***FY 2011 Plans:*** - Demonstrate initial 45nm RadHard prototype circuits to develop RadHard by design methods. - Complete prototype demonstration of a high-temporal fidelity gamma small experimentation capability. - Continue investigation of NIF as a potential NWE experimentation capability. - Complete Warm X-ray source experiments on Saturn. - Improve operational models of secondary and tertiary blast effects. ***FY 2012 Base Plans:*** - Demonstrate compatibility of 90nm RadHard by design library cells and macro with 90nm RadHard by process enhancements. - Perform full-scale MDA telescope response experiments on NIF - Investigate deuterium pinch neutron source on Z-machine at Sandia National Laboratories. - Implementation of human radiation induced performance decrement model into operational code. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	22.048	17.902	17.503	-	17.503

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RI: *Nuclear Survivability*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation Prevention and Defeat*	19.687	14.052	6.985		6.985	6.271	6.295	6.277	6.208	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Reduce facility overhead costs by disposition of excess government-owned simulator hardware at the West Coast Facility (WCF).

Development of cold and warm x-ray capabilities on the Saturn machine at Sandia National Laboratory that meet or exceed the equivalent capabilities at the WCF.

Weapon Effects Steering Committee: Coordinate and integrate nuclear weapon effects needs, capabilities and programs across the United States and United Kingdom defense communities and provide accreditation authority for all nuclear-related modeling and simulation.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RL: *Nuclear & Radiological Effects*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RL: *Nuclear & Radiological Effects*	21.813	16.776	25.343	-	25.343	23.922	23.968	25.202	25.620	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 modeling tools into net-centric 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, missiles, 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, develop and provide electromagnetic pulse assessment capabilities to support national and military operational planning, weapon effects predictions, and national strategic systems designs; and develop foreign nuclear weapon outputs.

The increase from FY 2011 to FY 2012 is due predominately to increased investment in and consolidation of key nuclear weapons effects functions in the Nuclear Weapons Effects Network (NWEN). This network will encompass all nuclear weapons effects related activities and, with the establishment of a first-principles nuclear weapon effects modeling and analysis capability contributing to the National Effects Enterprise.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RL: Nuclear & Radiological Effects	21.813	16.776	25.343	-	25.343
Description: Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapon effects predictions, and strategic system design decisions. ***FY 2010 Accomplishments:*** - Provided nuclear electromagnetic hardening and survivability support to USSTRATCOM, Defense Information Systems Agency, and Missile Defense Agency, elements of the Nuclear Command and Control System, and White House Communications Agency (WHCA) systems. - Conducted tests on USS New Orleans and USS Fresno from the Inactive Ship Fleet in support of a maritime EMP standard development. - Demonstrated the DTRA Automated Shielding Effectiveness Recorder at an operational WHCA communication node. - Completed the Redbook Vol IV (foreign nuclear weapon effects models) and delivered to the Navy Strategic Systems Program office. - Continued development of models allowing the predictions and analysis of nuclear survivability for ballistic missile defense system.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RL: *Nuclear & Radiological Effects*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Provided small scale testing in support of modeling and simulation (M&S) validation. - Continued EM-1 development; integration activities to include validation and verification, peer review, and coordination with experimentation efforts; published Joint Radiation Effects documentation. - Validated code for system response to X-Rays; validate and integrate M&S capability to understand thermo-structural response to X-Rays; validate and integrate M&S capability for satellite design. ***FY 2011 Plans:*** - Conduct tests of vulnerabilities of reprocessing facilities. - Begin Electro Magnetic Pulse (EMP) E1 physics-based code. - Provide collateral effects M&S for enrichment facilities. - Continue EM-1 development; continue publication of Joint Radiation Effects documentation. - Continue development of models allowing the predictions and analysis of nuclear survivability for Nuclear Command and Control System. - Continue to validate code for system response to X-Rays; validate and integrate Modeling and Simulation (M&S) capability to understand thermo-structural response to X-Rays; validate and integrate M&S capability for satellite design. ***FY 2012 Base Plans:*** - Standup of the Nuclear Weapons Effects Network (NWEN). - Model and code development, analyses at all computational levels of fidelity and run times. - Emphasize on re-initiation of quality NWE science via balanced modeling and simulation and experimentation. - Initial focus on first-principles model development and Uncertainty Quantification. - Complete non-ideal Source Region Electromagnetic Pulse (SREMP) Study. - Complete new version of United States Strategic Command's (USSTRATCOM) official strategic targeting code used to determine the probability of damage from nuclear weapon. - Complete new trapped radiation belt model. - Perform EMP test in support of the development of a maritime EMP standard for destroyer class ships. - Conduct EMP Assessment of Ramstein Global Communications Node and C4I EMP assessment on Nuclear Command and Control System facilities. - Develop techniques for assessing the High-Altitude EMP (HEMP) shielding and survivability of compact electronic subsystems used in DoD infrastructure. - Develop measurement procedures and test protocols for determining shielding effectiveness of composite materials and enclosures.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RL: *Nuclear & Radiological Effects*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Provide technical support for EMP survivability of worldwide deployment of new Modern Enterprise Terminals for global telecommunications. - Continue EM-1 development; continue publication of Joint Radiation Effects documentation.. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	21.813	16.776	25.343	-	25.343

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 117/0605000BR: *WMD Defeat Capabilities*	9.255	7.307	5.888		5.888	5.749	5.995	6.077	6.097	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Complete transition of all hazard source terms to the Chemical and Biological (Chem-Bio) Defense Program's Joint Effects Model (JEM) Block II enhancing our ability to predict hazards associated with weapons of mass destruction.

Develop and integrate baseline database of 80% of current foreign nuclear reactors and enrichment facilities.

Provide Department of Defense 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.

Transition required capabilities to the Chem-Bio Defense Program's JEM and Joint Operational Effects Federation, the Missile Defense Agency, U.S. Space Command, and U.S. Strategic Command's planning suite.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RM: *WMD Battle Management*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RM: *WMD Battle Management*	15.239	10.899	13.761	-	13.761	18.569	16.366	17.288	17.693	Continuing	Continuing

A. Mission Description and Budget Item Justification

The WMD Battle Management project provides applied research to support full and sub-scale testing required to investigate countering Weapons of Mass Destruction (WMD) weapon effects, and sensor performance, weapon effects modeling algorithm development, and the set-up of the Defense Threat Reduction Agency (DTRA) Experimentation Lab.

This project provides combatant commanders the prediction capability and the attack options to engage Hard & Deeply Buried Targets (HDBTs) as the proliferation and hardness of this class of targets increases. The project conducts weapon effects phenomenology tests, analyzes data, conducts high performance computer simulations, and creates/modifies software to more accurately model cratering effects, fragmentation (both primary & secondary), internal air blast, equipment/container damage, structural response, and penetration. These efforts will lead to advanced modeling capability in the countering WMD tools, Integrated Munitions Effects Assessment (weaponeering) and Vulnerability Assessment and Protection Option (force/structure protection). The Advanced Energetics & Counter WMD Weapons Program, transferred from RG to RM between FY11 and FY12, develops new novel energetic materials and weapon design technology for rapid, directed and enhanced energy release, providing new capability to defeat difficult WMD/HDB targets. The Advanced Energetics Program also develops new high energy systems well above chemical energy levels to defeat WMD targets beyond the reach of traditional high explosive blast/frag warhead technology.

The DTRA Experimentation Lab Capability is an Agency-wide capability that assures the timely acquisition, synchronization, correlation and delivery of Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE) consequence management and mitigation data necessary in combating WMD. The DTRA Experimentation Lab will be the “key enabler” allowing the Agency to transform successfully into an interoperable DoD Science and Technology environment. Through the use of the DTRA Experimentation Lab, DTRA will be able to shape and improve military situational awareness independent of time or location, effectively shorten decision cycles in a CBRNE event, and extend DTRA’s knowledge base externally through collaborative technologies.

The increase from FY 2011 to FY 2012 is predominately due to the transfer of Advanced Energetics effort from RG-Advanced Energetics to RM-Battle Management to properly align organizational responsibilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RM: WMD Battle Management	14.039	10.899	13.761	-	13.761
Description: Project RM provides (1) full scale testing of counter WMD weapon effects, sensor performance, and weapon delivery optimization, (2) weapon effects modeling, and (3) the Defense Threat Reduction Agency Experimentation Lab.					
FY 2010 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RM: *WMD Battle Management*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Conducted Ultra High Performance Concrete penetration tests and material analysis. Continued modeling. - Completed model for multi-hit attacks to hardened bunker roof slabs. - Performed testing and analysis of equipment fragility models. - Began Internal Detonation (quasi-static and dynamic pressure) fast running model development. - Coordinated across service labs to consolidate testing data for Weapons of Mass Destruction (WMD) agent release tests to facilitate finalizing an Agent Release Model. - Completed column satchel charge model. - Conducted blast door model testing and model modifications. - Completed construction for a full-scale progressive collapse test structure. - Continued to provide leading technological integration capabilities to the combating WMD mission through utilization of the Defense Threat Reduction Agency (DTRA) Experimentation Lab (DEL). - Continued to support demonstrations and experimentation events for the Countering WMD Continuity of Interest to include participation in Noble Resolve, Coalition Warrior Interoperability Demonstration, Urban Resolve, and Campaign X experimentation campaigns. - Continued facilitation of the internal Continuity of Operations Table Top Experiment through the DTRA Experimentation Lab DEL. - Conducted Ultra High Performance Concrete penetration tests and material analysis. Continue modeling. - Completed model for multi-hit attacks to hardened bunker roof slabs. Finalize or re-direct multi-hit research efforts. - Delivered 15 additional validated equipment fragility models. - Completed Quasi Static Pressure model. - Conducted testing and modeling improvements to the Weapons of Mass Destruction (WMD) Agent Release Model with emphasis on dry agents. - Completed column satchel charge model. - Conducted blast door model testing and model modifications. - Completed progressive collapse model. - Continued to provide leading technological integration capabilities to the combating WMD mission through utilization of the Defense Threat Reduction Agency (DTRA) Experimentation Lab (DEL). - Continued to support demonstrations and experimentation events for the Countering WMD Continuity of Interest to include participation in Noble Resolve, Coalition Warrior Interoperability Demonstration, Urban Resolve, and Campaign X experimentation campaigns.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RM: *WMD Battle Management*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Facilitated internal Continuity of Operations Table Top Experiment through the DTRA Experimentation Lab DEL. ***FY 2011 Plans:*** - Conduct Ultra-High Performance Concrete penetration tests and material analysis. Continue modeling and finalize evaluation of current models. - Deliver 15 additional validated equipment fragility models. - Complete validation and verification on Internal Detonation (quasi-static and dynamic pressure) model. - Conduct testing and modeling improvements to the WMD Agent Release Model. Complete validation and verification of dry agent model. - Conduct blast door model testing and model modifications. - Complete progressive collapse testing and model development for concrete frame structures. - Continue to provide leading technological integration capabilities to the combating WMD mission through utilization of the DTRA Experimentation Lab (DEL). - Continue to support demonstrations and experimentation events for the Countering WMD Community of Interest (COI) to include participation in Noble Resolve, Coalition Warrior Interoperability Demonstration, Urban Resolve, and efforts to prevent loose nukes experimentation campaigns. - Continue facilitation of the internal Continuity of Operations Table Top Experiment through the DEL. ***FY 2012 Base Plans:*** - Integrate first principle modeling codes into Graphical User Interface (GUI)-based hazard prediction models. - Facilitate Joint Concept Development & Experimentation (JCDE) for the Combating Weapons of Mass Destruction (C-WMD) Community of Interest. - Investigate and explore developmental technologies, such as Virtual Worlds. - Analyze, explore, and identify gaps, and barriers associated with CWMD Warfighter Challenges. - Complete facilitation of the internal Continuity of Operations Table Top Experiment through the DEL. - Plan, design, execute, and analyze warfighting experimentation in support of DTRA, and in coordination with the Services, Combatant Commands, Defense agencies, and the inter-agency as appropriate. - Develop capability to model equipment fragility for any generic equipment. - Finalize Internal Detonation (quasi-static and dynamic pressure) model. - Begin test program for blast propagation through failing bunker walls from blast and fragmentation. - Conduct testing and modeling improvements to the WMD Agent Release Model. - Complete blast door model verification and validation.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RM: *WMD Battle Management*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Conduct progressive collapse testing and begin modeling effort for steel frame structures. - Evaluate technology transfer to cruise missile payload. - Integrate bimodal fuel particles, packet charges and reactive cases into weapon payload. - Study agent defeat using hybrid enhanced blast explosives, reactive cases, target coherent energetic reactions, and target directed energetic reactions. - Incorporate SHAMRC Workshop recommendations into improved SHAMRC code; compare the simulated results with test results. - Document the progress made for antiparticle trap, super halogen molecule and high nitrogen explosives.					
Accomplishments/Planned Programs Subtotals	14.039	10.899	13.761	-	13.761

	FY 2010	FY 2011
Congressional Add: National Center for Blast Mitigation & Protection	1.200	-
FY 2010 Accomplishments: - Improved high fidelity analyses for internal blast environments and weapon-target interactions. - Improved internal blast models to enhance DTRA's Vulnerability Assessment & Protection Option (VAPO) and Integrated Munitions Effects Assessment (IMEA) planning tools. - Enhanced computational ability for the Agency to save time in generating target solutions.		
Congressional Adds Subtotals	1.200	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation, Prevention and Defeat*	33.888	28.260	22.303		22.303	20.403	20.727	21.137	21.700	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Percent confidence in engineering models.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RM: *WMD Battle Management*

Percent confidence in assessment solutions.

Number of targets successfully planned.

Time required to complete assessments.

The DTRA Experimentation Lab (DEL) is occupied by planning or execution efforts 75% of the year.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RR: *Test Infrastructure*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RR: *Test Infrastructure*	16.648	21.528	21.941	-	21.941	19.517	21.870	22.149	22.740	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Test Infrastructure project provides a unique national test bed capability for simulated Weapons of Mass Destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs by developing and maintaining test beds used by the Department of Defense (DoD), the 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. It leverages fifty years of testing expertise to investigate weapons effects and target response across the spectrum of hostile environments that could be created by proliferant nations or terrorist organizations with access to advanced conventional weapons or WMD (nuclear, biological and chemical). The project maintains testing infrastructure to support the testing requirements of warfighters, other government agencies, and friendly foreign countries on a cost reimbursable basis. It creates testing strategies and a WMD Test Bed infrastructure focusing on the structural response of buildings and Hard & 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 aboveground 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RR: Test Infrastructure	16.648	21.528	21.941	-	21.941
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 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 2010 Accomplishments:*** - Began design and procurement of an add-on structure for Component Test Structure-3 for structural stress tests with Singapore. - Conducted nuclear detection and forensics testing. - Conducted nuclear detection and forensics testing for the Department of Homeland Security (DHS), Domestic Nuclear Detection Office (DNDO) in accordance with the DTRA- Domestic Nuclear Detection Office (DNDO) Memorandum of Agreement. - Conducted WMD sensor testing at the Technical Evaluation Assessment and Monitor Site (TEAMS); provided infrastructure upgrades for TEAMS.				

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RR: *Test Infrastructure*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continued environmental remediation and compliance activities at the Nevada Test Site, Dugway Proving Grounds, White Sands Missile Range, and Kirtland Air Force Base Chestnut Site. - Continued infrastructure and instrumentation upgrades to ensure test beds meet customers' advanced technology testing needs. - Conducted testing in support of the USAF responsible test organization, the Air Armament Center (AAC), for the Massive Ordnance Penetrator (MOP) Quick Reaction Capability (QRC) Program. ***FY 2011 Plans:*** - Complete construction of add on structures to Component Test Structure -3 to develop weapons effects and mitigation test data models for fire and blast in cooperation with the Singapore government with estimated start date for testing first quarter FY 2011. - Upgrade and integrate instrumentation mobile wireless "Mesh" infrastructure capabilities and improvements in support of the Department of Home Land Security/ Domestic Nuclear Detection Office (DHS/DNDO) tests conducted at DTRA and DHS/DNDO defined CONUS wide locations in support of DHS/DNSO Secure the Cities (STC), Lower Manhattan Security Initiative (LMSI) and other functional tests as defined by DHS/DNDO during the first quarter FY 2011. - Conduct Interagency Biological Restoration Demonstration (IBRD) testing in conjunction with DoD & DHS to reduce the time and resources necessary to recover and restore wide urban areas, Military Installations, and critical infrastructure following a biological incident with estimated start date second quarter FY 2011. - Construct facility for Integrated Test Demonstration to defeat credible and threat-based scenarios with an estimated start date for testing of third quarter FY 2011. - Conduct testing on Chemical, Biological, Radiological, Nuclear and Explosive sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking targets used for WMD activities during the third and fourth quarters FY 2011. - Conduct WMD Aerial Collection System testing which is designed to meet U.S. Forces Korea's requirement of an "all-in-one" Chemical Biological Radiological & Nuclear sensor system for post-strike assessment (Battle Damage Assessment) of suspected WMD facilities and mobile time-sensitive targets during third and fourth quarters FY 2011. - Conduct nuclear detection and forensics testing to prevent weapons grade material/dirty bombs from entering the U.S., U.S. Territories, and Allied Nations with estimated start date of fourth quarter FY 2011. - Conduct Weapons of Mass Destruction sensor testing at the Technical Evaluation Assessment and Monitor Site to detect nuclear grade material from entering the U.S., U.S. Territories, and Allied Nations through rail, ship, and air ports with estimated start date of fourth quarter FY 2011.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RR: *Test Infrastructure*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continue environmental remediation and compliance activities at the Nevada Test Site, Dugway Proving Grounds, White Sands Missile Range, and Kirtland Air Force Base in accordance with Environmental Protection Agency (EPA), Safety, & Environmental guidelines throughout FY 2011. - Develop Cost Analysis Tool for Test Sites database to develop Rough Order of Magnitude estimates for different types of tests as well as different test beds during FY 2011. - Conduct tunnel work detection testing at Nevada Test Site for the Customs and Border Patrol to be able to detect tunnel work or tunnels along northern and southern borders of CONUS; estimated for fourth quarter FY 2011. - Continue infrastructure and instrumentation upgrades to ensure test beds meet customers' advanced technology testing needs. - Document, prioritize, and support test infrastructure requirements. ***FY 2012 Base Plans:*** - Develop and implement prototype Voice Over Internet Protocol (VOIP) system that can transfer both classified and unclassified data, voice communications, video, etc., to support test program execution starting first quarter FY 2012. - Modify existing test infrastructure or develop test infrastructure to support revitalized Weapons Effects Phenomenology Program supporting DTRA test programs. - Make improvements to existing test infrastructure and test articles, or construct new test articles to support DTRA Detection Technology Program starting in first quarter FY 2012. - Conduct testing in support of Treaty Verification Technologies Program and Source Physics Experiments to support Comprehensive Test Ban Treaty Initiatives, New START Warhead Verification, and detection and verification of Biological and Chemical Weapons. - Continue support of Weapons of Mass Destruction sensor testing at the Technical Evaluation Assessment and Monitor Site (TEAMS) to detect and prevent nuclear grade material from entering the U.S., U.S. Territories, and Allied Nations through rail, ship, and air ports. - Continue Interagency Biological Restoration Demonstration (IBRD) testing in conjunction with DoD and DHS to reduce the time and resources necessary to recover and restore wide urban areas, military installations, and critical infrastructure, following a biological incident. - Continue testing Chemical, Biological, Radiological, Nuclear, and Explosive sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking targets used for WMD activities.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RR: *Test Infrastructure*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continue WMD Aerial Collection System testing that is designed to meet U.S. Forces Korea's requirement of an "all-in-one" Chemical, Biological, Radiological, and Nuclear sensor system for post-strike assessment (Battle Damage Assessment) of suspected WMD facilities and mobile time-sensitive targets. - Continue nuclear detection and forensics testing to prevent weapons grade material/dirty bombs from entering the U.S., U.S. Territories, and Allied Nations. - Continue Weapons of Mass Destruction sensor testing at the Technical Evaluation Assessment and Monitor Site to detect and prevent nuclear grade material from entering the U.S., U.S. Territories, and Allied Nations through rail, ship, and air ports. - Continue environmental remediation and compliance activities at the Nevada Test Site, Dugway Proving Grounds, White Sands Missile Range, and Kirtland Air Force Base in accordance with EPA, Safety, and Environmental guidelines throughout FY 2012. - Continue development of a Cost Analysis Tool for Test Sites database to develop Rough Order of Magnitude estimates for different types of tests as well as different test beds during FY 2012. - Continue tunnel work detection testing at Nevada Test Site for the Customs and Border Patrol to be able to detect tunnel work or tunnels along northern and southern borders of CONUS. - Continue infrastructure and instrumentation upgrades to ensure test beds meet customers' advanced technology testing needs. - Document, prioritize, and support test infrastructure requirements.					
Accomplishments/Planned Programs Subtotals	16.648	21.528	21.941	-	21.941

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Number of tests executed safely, i.e., no loss of life or limb, no unintentional significant damage of property.

Number of tests that go through the milestone review process.

Number of tests that undergo environmental assessment consistent with existing Environmental Impact Statements.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RT: *Target Assessment Technologies*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RT: *Target Assessment Technologies*	0.486	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Target Assessment Technologies provides the Combatant Commands and the Intelligence Community with technologies and processes to find and characterize hard and deeply buried targets and then assess the results of attacks against those targets. Overall objectives are to develop new methodologies, processes and technologies for detecting, locating, identifying, physically and functionally characterizing, modeling, and assessing new and existing hard and deeply buried targets to support full dimensional defeat operations. Extending this activity and applying these processes to Weapons of Mass Destruction (WMD) target characterization and threat analysis presents the next technical challenge. The Target Assessment Technologies project consists of three subordinate and related activities: (1) Targeting and Intelligence Community Technology Development; (2) Find, Characterize, Assess Technology Development; and (3) Counter WMD Analysis Cell Technology Support. Additionally, this project is researching technology applications for treaty verification mission.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Project RT: Target Assessment Technologies	0.486	-	-	-	-
Description: Project RT provides the Combatant Commands and the Intelligence Community with technologies and processes to find and characterize hard and deeply buried targets and then assess the results of attacks against those targets.					
FY 2010 Accomplishments: - Researched treaty verification mission support technology applications.					
Accomplishments/Planned Programs Subtotals	0.486	-	-	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 28/0603160BR: *Proliferation, Prevention, and Defeat*	33.097	35.112	32.837		32.837	32.014	31.084	31.759	32.429	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RT: *Target Assessment Technologies*

E. Performance Metrics

Not Applicable

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RU: *Fundamental Research for Combating WMD*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
RU: *Fundamental Research for Combating WMD*	13.876	10.385	8.631	-	8.631	8.065	7.754	7.530	7.583	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Fundamental Research for Combating WMD project (1) conducts strategic studies to support Department of Defense, (2) develops decision support tools and conducts analyses to support combating Weapons of Mass Destruction (WMD) research and development investments, and (3) advances emerging technology and transitional science into viable applied technology development capabilities. The strategic studies address challenges in reducing the threat from WMD based on an assessment of the future national security environment. They also develop and maintain an evolving analytical vision of necessary and sufficient capabilities to protect the U.S. and allied forces and citizens from nuclear, biological, and chemical attack and identify gaps in these capabilities and initiate programs to fill them. The decision support tools identify key technology and performance parameters required for products generated under research and development investments. These tools also assess the expected impact on military missions and forces. The advancement of technology and science into applied technology development effort focus upon increasing the stability and utility of mid-to-long term, moderate risk but high payoff science, and emerging technologies for transition to other Defense Threat Reduction Agency (DTRA) applied technology programs. This effort serves as the bridge between the bench scientist and the applied technologist.

Beginning in FY 2010, this project was rebalanced to transition the decision support tools efforts into Project RA - Systems Engineering and Innovation to enhance corporate capabilities across all projects.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RU: Fundamental Research for Combating WMD	10.356	10.385	8.631	-	8.631
Description: Project RU provides (1) strategic studies to support DoD, (2) Decision support tools and analysis to support combating WMD research and development investments, and (3) early applied research for technology development. ***FY 2010 Accomplishments:*** - Transitioned decision support tools with current and out year funding to Project RA - Systems Engineering and Innovation. - Identified and conducted strategic studies addressing challenges in reducing the threat from WMD. - Exercised the test bed to assess promising technologies to quantify and mitigate large area nuclear effects on systems, networks and equipment. - Initiated “bridging” projects for early applied development of combating WMD technologies, initiate transition to appropriate long-term sponsors for concept/design validation, prototype fabrication, testing, and fielding.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RU: *Fundamental Research for Combating WMD*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Completed the final operational capability for pilot program to support Department of Defense effort to utilize a web-based system for research proposal submission, evaluation and status reporting. - Provided technical expertise and advice to generate the new basic research topics in support of the semi-annual solicitation. - Continue examination of emerging technologies and underlying sciences applicable to combating WMD with increased emphasis on avoiding technical surprise. - Continued the mentoring, sponsorship, and education of the “Next Generation” of mission-critical scientific, technical and engineering expertise. ***FY 2011 Plans:*** - Identify and transition all suitable investigatory Science and Technology research and development projects to appropriate long-term sponsors for concept/design validation, prototype fabrication, testing, and fielding. - Identify and conduct strategic studies addressing challenges in reducing the threat from WMD. - Assess utility of continuing test bed; continue to exercise the test bed to assess promising technologies to quantify and mitigate large area nuclear effects on systems, networks and equipment. - Continue “bridging” projects for early applied development of combating WMD technologies. - Continue to provide technical expertise and advice to generate the new basic research topics in support of the semi-annual solicitation. - Continue the mentoring, sponsorship, and education of the “Next Generation” of mission-critical scientific, technical and engineering expertise. ***FY 2012 Base Plans:*** - Identify and transition all suitable investigatory Science and Technology research and development projects to appropriate long-term sponsors for concept/design validation, prototype fabrication, testing, and fielding. - Identify and conduct strategic studies addressing challenges in reducing the threat from WMD. - Continue “bridging” projects for early applied development of combating WMD technologies. - Continue to provide technical expertise and advice to generate the new basic research topics in support of the semi-annual solicitation. - Continue the mentoring, sponsorship, and education of the “Next Generation” of mission-critical scientific, technical and engineering expertise. ***FY 2012 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RU: *Fundamental Research for Combating WMD*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
.					
Accomplishments/Planned Programs Subtotals	10.356	10.385	8.631	-	8.631

	FY 2010	FY 2011
Congressional Add: University Strategic Partnership ***FY 2010 Accomplishments:*** CON02 – University Strategic Partnership ($1,920) -Supported early technology development for the Counter-WMD mission area across multiple science areas including new materials for radiation detectors, survivable electronics, and computational modeling. -Collaborated with universities to stimulate interest in cutting edge Counter-WMD research with a strategic goal for fostering the growth of scientific talent for the Counter-WMD workforce.	1.920	-
Congressional Add: Center for Nonproliferation Studies – Monterey Institute ***FY 2010 Accomplishments:*** -Supported early technology development for the Counter-WMD mission area across multiple science areas including new materials for radiation detectors, survivable electronics, and computational modeling. -Collaborated with universities to stimulate interest in cutting edge Counter-WMD research with a strategic goal for fostering the growth of scientific talent for the Counter-WMD workforce.	1.600	-
Congressional Adds Subtotals	3.520	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• 1/0601000BR: *DTRA Basic Research Initiative*	40.848	47.412	47.737		47.737	48.071	48.493	48.925		Continuing	Continuing

D. Acquisition Strategy

Not Applicable

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 percentage of participating universities on the US News & World Report "Best Colleges" list.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602718BR: *WMD Defeat Technologies*	PROJECT RU: *Fundamental Research for Combating WMD*

Minimum 10% increase in the number of new universities participating in the basic research grant program from FY 2008-2010.

Publication of an annual basic research technical and external programmatic review report.

Each study/project will commence within 3 months of customer request and results delivered within 3 months of completion.