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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*

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	236.408	295.163	283.073	-	283.073	278.100	282.135	284.607	290.856	Continuing	Continuing
RA: *Systems Engineering and Innovation*	8.435	7.270	13.641	-	13.641	7.826	8.891	9.174	10.028	Continuing	Continuing
RE: *Counter-Terrorism Technologies*	59.627	102.395	114.337	-	114.337	114.657	115.798	115.964	117.728	Continuing	Continuing
RF: *Detection Technology*	64.986	90.688	77.784	-	77.784	76.298	77.863	78.528	80.321	Continuing	Continuing
RG: *Advanced Energetics & Counter WMD Weapons*	16.688	17.386	15.186	-	15.186	20.631	21.477	21.768	22.442	Continuing	Continuing
RI: *Nuclear Survivability*	19.687	14.052	6.985	-	6.985	6.271	6.295	6.277	6.208	Continuing	Continuing
RM: *WMD Battle Management*	33.888	28.260	22.303	-	22.303	20.403	20.727	21.137	21.700	Continuing	Continuing
RT: *Target Assessment Technologies*	33.097	35.112	32.837	-	32.837	32.014	31.084	31.759	32.429	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Proliferation, Prevention and Defeat program reduces Weapons of Mass Destruction (WMD) proliferation and enhances WMD defeat capabilities through advanced technology development. To accomplish this objective, seven project areas were developed: RA - Systems Engineering and Innovation, RE - Counter-Terrorism Technologies, RF - Detection Technology, RG - Counter WMD Weapons & Capabilities, RI - Nuclear Survivability, RM - WMD Battle Management, and RT - Target Assessment Technologies. This supports technology requirements in line with the Joint Functional Concepts (Chairman, Joint Chiefs of Staff Instruction 3170.01). The missions and plans of these projects are described below and in the R-2a Budget Exhibits.

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.

Project RE provides research and development support to Joint U.S. Military Forces, specifically U.S. Special Operations Command (USSOCOM) in the areas of Device Defeat, counter WMD technologies for warfighters, USSOCOM Counter Weapons of Mass Destruction – Terrorism (CWMD T) Support Program (SCSP) 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, and oversight of Counterproliferation (CP) research and development resources sent directly to USSOCOM for Special Operations Forces (SOF)-unique CP technologies.

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*

Project RF develops technologies, systems and procedures for post-detonation nuclear forensics, and 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.

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 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.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	238.773	295.163	302.977	-	302.977
Current President's Budget	236.408	295.163	283.073	-	283.073
Total Adjustments	-2.365	-	-19.904	-	-19.904
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	1.230	-			
• SBIR/STTR Transfer	-3.595	-			
• Realignment / Directed Efficiencies	-	-	-19.904	-	-19.904

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Project: RF: *Detection Technology*		
Congressional Add: *AELED IED Electronic Signature Detection*	4.800	-
Congressional Add Subtotals for Project: RF	4.800	-
Congressional Add Totals for all Projects	4.800	-

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Change Summary Explanation

The FY 2010 decrease from the previous President's Budget submission is due to the internal SBIR reprogramming action, the FY 10-23IR reprogramming action to realign a $1,920 Congressional Add to the proper executing agency, and the FY 10-11PA reprogramming action in support of higher priority Department needs.

The FY 2012 decrease is predominately attributed to the net effect of Departmental direction for increased efficiency in the area of Advisory & Assistance Services and other contractual services, increased investment for expanded capacity in Technical Reachback. support of increased user requests for information on Weapons of Mass Destruction (WMD) effects and their consequences, and the conversion of 0603160BR funds to 0602718BR to better reflect the nature of the Radiation Hardened (RadHard) Microelectronics efforts in the RI-Nuclear Survivability budget project. The 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 toward development and evaluation of technical feasibility. Also contributing to the reduction are program reductions made to comply with Department guidance to identify funds to support higher priority mission areas.

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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*	8.435	7.270	13.641	-	13.641	7.826	8.891	9.174	10.028	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. This includes analysis of National, Department of Defense (DoD) and other Federal agencies' strategic guidance and plans in the combating Weapons of Mass Destruction (WMD), Combating Terrorism and Homeland Defense arenas through analytical political-military and technical studies, workshops and conferences. It also provides the Defense Threat Reduction Agency (DTRA) on-site support to North Atlantic Treaty Organization (NATO) and Supreme Headquarters Allied Powers, Europe (SHAPE) with a current primary focus on support to U.S. European Command (USEUCOM), NATO, and SHAPE in combating WMD and maintaining the NATO nuclear deterrent. A significant element of this project includes support to Command Elements and the warfighting Combatant Commands (COCOMs) on strategies for reducing/countering the WMD threat in the COCOMs Areas of Responsibility. This project also provides for the solution to the Secretary of Defense mandate for DTRA to account, maintain, report, and track the National Nuclear Weapons Stockpile & Nuclear Weapon-Related Materiel during peacetime, crisis, and wartime. In support of national requirements necessary to maintain a viable nuclear deterrent, the Defense Integration and Management of Nuclear Data Services provides a platform to ensure continued sustainability and viability of the nuclear weapon stockpile.

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	8.435	7.270	13.641	-	13.641
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:*** - Institutionalized development of Combating WMD lessons learned in regional COCOMs theaters and with appropriate international staffs. - Continued to support development and update of the Defense Threat Reduction Agency (DTRA) annexes to U. S. European Command (USEUCOM) Theater Security Cooperation Plans to insure DTRA assets are used to further Combating WMD mission in that theater. - Institutionalized linkage with NATO/SHAPE and USEUCOM in international research and development collaboration.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continued to work with SHAPE J3 and J6 for survivable, reliable communications to assure command, control and positive control of the nuclear mission with the goal of NATO Infrastructure Committee procurement. - Continued to conduct strategic analyses and assessments on emerging WMD threats. - Continued to organize/conduct senior COCOMs, Interagency, and International workshops, symposiums, and table top exercises to address key national/international strategies for reducing/combating the WMD threat. ***FY 2011 Plans:*** - Continue to conduct strategic analyses and assessments on emerging WMD threats. - Continue to organize/conduct senior COCOM, Interagency, and International workshops, symposiums, and table top exercises to address key national/international strategies for reducing/combating the WMD threat. - Continue to refine and enhance WMD lessons learned process with international staff and across the other COCOMs, incorporating lessons learned from partner activities. - Continue to develop and update the Defense Threat Reduction Agency (DTRA) Campaign Support Plan as directed in the Global Employment of Forces (GEF) to further Combating WMD mission across all theaters while balancing DTRA assets and managing risks as prioritized within the GEF. - Utilize institutionalized linkage with NATO/SHAPE and USEUCOM in international research and development collaboration to further develop similar international research and development collaboration within the Pacific Region in accordance with the GEF. ***FY 2012 Base Plans:*** - 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 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. - Continue to organize/conduct senior COCOM, Interagency, and International workshops, symposiums, and table top exercises to address key national/international strategies for reducing/combating the WMD threat. - Continue to refine and enhance WMD lessons learned process with international staff and across the other COCOMs, incorporating lessons learned from partner activities. - Continue to develop and update DTRA Support Plan as directed in the GEF to further Combating WMD mission across all theaters while balancing DTRA assets and managing risks as prioritized within the GEF. - Continue to utilize institutionalized linkage with NATO/SHAPE and USEUCOM in international research and development collaboration to further develop similar international research and development collaboration within the Pacific Region in accordance with the GEF.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continue to conduct strategic analyses and assessments on emerging WMD threats. - Increase the capacity of Technical Reachback through the development and integration of high performance computing and geospatial services for decision support – support projected workload of over 1,800 requests for information. - Building partner capacity through advanced technology demonstrations to increase the technical capacity of international partners. - Develop, test, and deploy Arms Control Enterprise System (ACES) New START Treaty (NST) Increment #2 mid FY12 providing production facility, weapon transfer, annual nuclear weapons platform Conversion or Elimination plans and flight route notification capability - Develop, test, and deploy ACES NST Increment #3 end FY12 providing prototypes, new equipment, demonstrations and telemetry notification capability. Increment #3 will be fully operational capability (FOC) of ACES NST software upgrade. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	8.435	7.270	13.641	-	13.641

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
• 22/0602718BR: *WMD Defeat Technologies*	49.387	53.464	42.112		42.112	41.379	40.652	41.600	41.440	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Development of a DoD annex to the National Response plan for a pandemic flu and subsequent national-level exercises to test plan.

Development of Defense Threat Reduction Agency (DTRA) Security Cooperation Plans for all regional Combatant Commands (COCOMs).

Development of a DTRA gap analysis of Combating Weapons of Mass Destruction (CWMD) mission vice Homeland Defense and Combating Terrorism mission areas to provide way ahead for DTRA operational and research and development planning.

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Robust lessons learned process that incorporates new, workable operational and technical solutions into DoD and with allies.

Incorporation of at least three new technologies by FY 2013 as a result of International research and development collaboration.

Number of strategic analyses and assessments conducted on emerging WMD threats.

Number of senior Combatant Commands (COCOMs), Interagency and/or International Workshops/Conferences organized/conducted to address national/international strategies for reducing the WMD threat.

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

Support the Office of Secretary of Defense, Joint Staff, Combatant Commands, Services, Nuclear Weapon Custodial Units, and Department of Energy.

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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*	59.627	102.395	114.337	-	114.337	114.657	115.798	115.964	117.728	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter-Terrorism Technologies project is an over-arching project that develops and transitions the full spectrum of new technologies for Joint U.S. Military Forces to counter WMD enabling warfighters, specifically Special Operations Forces (SOF), to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, nuclear production, storage, and weaponization facilities. This project supports Joint U.S. Military Forces, and in particular, the U.S. Special Operations Command (USSOCOM). This research and development support to USSOCOM is one of the highest priority mission areas in the Overseas Contingency Operations and a top priority for Defense Threat Reduction Agency (DTRA). The FY 2011 increase built upon the FY 2010-2015 request in support of the Combating WMD-Terrorism (CWMD-T) over guidance instruction to increase funding for USSOCOM Counterproliferation (CP) R&D, Explosive Ordnance Disposal (EOD) Device Defeat, alternative WMD defeat program, and the USSOCOM CWMD T Support Program (SCSP). The following efforts are included in this project:

Provide oversight for Counterproliferation (CP) research and development resources sent directly to USSOCOM that are used to develop SOF-unique technologies in support of USSOCOM's CP mission. New CP technologies are developed under USSOCOM management that provides SOF with the operational capability to counter WMD threats.

The EOD Device Defeat effort develops innovative technologies, energetic materials, and software programs to identify, defeat, contain and mitigate Weapons of Mass Destruction (WMD) capable Improvised Explosive Devices. DTRA has been delegated the responsibilities and authority to act as Task Lead on behalf of the Department of Defense (DoD) to provide leadership, integration, development, and testing as the primary U.S. Government coordinator for the National Implementation Plan WMD-Terrorism Task 5.4.4. EOD Device Defeat began with minimal funding in FY 2008 and received its first increment of funding in FY 2010, thus starting the multi-year development effort. The Bold Gambler (BG) program is an EOD Device Defeat effort that transferred to this RE Project from RF-Detection technology. BG adds targeted rapid development of tools, techniques and procedures for the access, and advanced diagnostics and defeat of WMD systems and improvised devices. The focus of the activity is prototype development and transition of promising technologies to the user for procurement.

The SCSP 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 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.

The CWMD-T alternate defeat program builds upon the collaborative effort with the warfighter that delivered a proof of concept to USSOCOM in June 2007 and provides a multi-mission oriented critical capability that may be applied throughout the entire spectrum of warfare while significantly eliminating collateral damage. It will develop technologies to enable the warfighter to locate, identify, characterize and access WMDs, their production and storage facilities and associated enablers along multiple nodes concurrently or simultaneously within the terrorist pathway to disrupt, delay, degrade, destroy or deny Chemical, Biological, Radiological and Nuclear

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WMDs while minimizing risk to US forces in support of Counterproliferation and Counterterrorism Offensive operations. The program specifically addresses USSOCOM Directive 70-1 Appendix C, Special Mission Area Programs and 71-4 Force Development SOF Capabilities Integration and Development Systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RE: Counter-Terrorism Technologies	59.627	102.395	114.337	-	114.337

Description: Project RE provides research and development support to Joint U.S. Military Forces, specifically U.S. Special Operations Command (USSOCOM) in the areas of Device Defeat, counter WMD technologies for warfighters, USSOCOM Counter Weapons of Mass Destruction – Terrorism (CWMD T) Support Program (SCSP) 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, and oversight of Counterproliferation (CP) research and development resources sent directly to USSOCOM for Special Operations Forces (SOF)-unique CP technologies.

FY 2010 Accomplishments:
- Continued development and then transition new technologies for Joint U.S. Military Forces to counter WMD, enabling warfighters, specifically SOF, to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities.
- Characterized material properties of Ultra-High Performance Concrete and delivered Final Report to Coalition Warfare partners.
- Initiated funding for three 48-month technology solutions.
- Began EOD work on following Knowledge Management Objectives: threat assessment on fireset designs; characterization & testing; classified Research and Development programs to counter emergent threat(s).
- Developed and began transitioning innovative counter-WMD tools designed to locate, identify, characterize, assess and attack WMD production and storage facilities with minimal to no collateral damage or loss of life.
- Established Initial Operational Capability (IOC) for SCSP.
- Integrated and federated national intelligence with operations research systems analysis capabilities to support planning and operations.

FY 2011 Plans:
- Continue development and then transition new technologies for Joint U.S. Military Forces to counter Weapons of Mass Destruction (WMD), enabling warfighters, specifically SOF, to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities. These efforts use innovative technologies utilizing energetic, mechanical and alternative energies to improve the efficiencies and effectiveness of Joint U.S. Military Ground Force's offensive operations against Chemical, Biological, Radiological, Nuclear Effects (CBRNE) WMD production facilities.

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Develop test articles for development of Ultra High-Performance Concrete tactics, techniques, and procedures. - Develop tools to enable the warfighter to combat against WMDs, their production and storage facilities and associated enablers anywhere within the terrorist pathway. - Initiate funding for three 48-month technology solutions. - Continue work on following Knowledge Management Objectives: Threat Assessment, acquire emergent fire set design and build; characterization & testing; classified R&D programs to counter emergent threat(s). - CWMD-T Support Program achieves Full Operational Capability. Develop advanced IT infrastructure and capabilities for processing, analysis, modeling, simulation and planning; and begin development of methodologies for anticipating rare events. - Develop and transition innovative counter-WMD tools designed to locate, identify, characterize, assess and attack WMD production and storage facilities with minimal to no collateral damage or loss of life (Tempest Edge). - Conduct surreptitious Sensitive Site exploitation of high priority WMD facilities through the use of highly effective tools designed to defeat WMD production systems and enabling technologies (Tempest Edge). - This project implements the acquisition strategy contained in USSOCOM Directive 70-1, Appendix C, Special Mission Area Programs and Directive 71-4 Force Development Special Operations Forces Capabilities Integration and Development Systems (Tempest Edge). - Explosive Ordnance Disposal (EOD) Device Defeat: Develop technologies and tools that characterize and identify the electronic environment and any improvised electronic triggering and firing system (EOD Device Defeat). - Develop tools to enable warfighters to locate, identify and render safe improvised WMD systems (EOD Device Defeat). - Enhance the threat assessment to replicate WMD triggering designs to be reproduced and tested in order to develop render safe procedures (EOD Device Defeat). - Barrier Defeat will develop tools which enhance defeat solutions to “breach” a variety of WMD barriers (perimeter, external, internal) using a range of breaching techniques, equipment and material (Target Defeat). - Production Defeat will develop tools that enable ground forces to destroy “critical nodes” used in the production and support of WMD (Target Defeat). - Structural Defeat will provide tools for the destruction of key entry points while collapsing the structure or rendering it unusable (Target Defeat). - Continue Counter-Smuggling Network development, and utilize University Strategic Partnership to develop a Black Sea Regional Academic Network in support of the Global Initiative to Combat Nuclear Terrorism. ***FY 2012 Base Plans:***					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continue development and then transition new technologies for Joint U.S. Military Forces to counter Weapons of Mass Destruction (WMD), enabling warfighters, specifically SOF, to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities. These efforts use innovative technologies utilizing energetic, mechanical and alternative energies to improve the efficiencies and effectiveness of Joint U.S. Military Ground Force's offensive operations against CBRNE WMD production facilities. - Develop and transition innovative counter-WMD tools designed to locate, identify, characterize, assess and attack WMD production and storage facilities with minimal to no collateral damage or loss of life. - Continue funding and manage progress for three 48-month technology solutions that began in FY10 - CWMD-T Support Program will continue to develop the Dynamic Picture of the Operating Environment (DPOE) for the CWMD Community of Interest. - Improve methodologies for anticipating plausible terrorist WMD threats to support operational planning and research. - Develop systemic operational plans for integrating diplomatic, military, economic, financial, intelligence and law enforcement to counter proliferation of WMD and acquisition by known terrorist organizations. - Begin development of next generation imaging capabilities to allow EOD forces advanced diagnostic capabilities. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	59.627	102.395	114.337	-	114.337

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

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

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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*	64.986	90.688	77.784	-	77.784	76.298	77.863	78.528	80.321	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 (NTNF) 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- 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.

Efforts within the program element are rebalanced beginning in FY 2010 to support the nuclear forensics Joint Capability Technology Demonstration (JCTD) to employ mature technologies and to improve procedures to address gaps identified by the NTNF Capabilities Based Assessment to advance capabilities across the entire post detonation NTNF system.

The FY 2011 budget increase predominately reflects funding increases for Nuclear Forensics. This accelerates development and implementation of accurate, rapid, and reliable global nuclear forensic capabilities to collect, analyze, and evaluate post-detonation prompt data and ground debris from a nuclear or radiological event to support attribution and National decision-making. It also funds Helium-3 (He-3) replacement to develop technologies and components that serve as one-for-one replacements for systems that rely on He-3 technology. Additionally, it supports Arms Control Monitoring & Verification Technology to develop systems and technologies to improve monitoring and verification capabilities that are responsive to the new security environment without compromising sensitive US information in the international arena for the arms control treaty regime. . Additionally, it supports Arms Control Monitoring & Verification Technology by developing systems and technologies to improve monitoring and verification capabilities that are responsive to the new security environment, but without compromising sensitive US information in the international arena for the arms control treaty regime.

The decrease from FY 2011 to FY 2012 is predominately due to the transfer of the Bold Gambler program to project RE-Counter Terrorism Technologies to better reflect the progression of that program and also to fund increased investment for the nuclear weapons effects, modeling, and simulation capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RF: Detection Technology	60.186	90.688	77.784	-	77.784

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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*	PROJECT RF: *Detection Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Description: Project RF develops technologies, systems and procedures for post-detonation nuclear forensics, and 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 stand off Bremsstrahlung active interrogation system JCTD to develop a system capable of detecting 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. - 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. - Provided enhanced technical support and analysis to the Nuclear Weapons Council and Nuclear Weapons Council Standing and Safety Committee and other high-level committees and senior decision makers to transform the nuclear stockpile and infrastructure. - Investigated the use of muon and proton beams for standoff stimulation of fission in nuclear materials and conducted experiments to validate the feasibility of the approach. - Continued development of next generation ground sample collection platforms for Improvised Nuclear Device (IND) and Radiological Dispersion Device (RDD) collections. - Continued development of prototype sensor suite for mapping rad field to be mounted on rotor wing Unmanned Aerial Vehicles (UAV) in support of ground sample collections. - Continued cooperation and acceptance of DTRA developed detection technologies for operational deployment. - Continued transitioning multiple near term technologies to generate prototypes and design packages to assist ground forces. - Exercised developmental collection capabilities with table top experiment, command post exercise, and field test experiment. - Continued robotic ground sample collection improvements.					

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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*	PROJECT RF: *Detection Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
-- Completed first round of development of unattended sensor technologies for rapid detection and identification of radiological material. - Continue development of contour mapping technologies for radiation field analysis. ***FY 2011 Plans:*** - Complete development of a fielded standoff active interrogation system for standoff detection and warning of hidden and shielded nuclear material. - Complete development of a baseline Department of Defense 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 and debris sample collection, sample analysis, and integration of design modeling and forensic data to support development of technical conclusions. - Begin development of fieldable (integrated and deployable) enhanced/rapid separation, dissolution and analysis laboratory capabilities and prototype novel technologies to shorten the analysis timeline. - Provide enhanced technical support and analysis to the Nuclear Weapons Council and Nuclear Weapons Council Standing and Safety Committee and other high-level committees and senior decision-makers to transform the nuclear stockpile and infrastructure. - 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. Complete development, validation and transition of seismic/air blast model to improve yield accuracy. - Complete development of contour mapping technology prototype for radiation field analysis. - 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					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*	PROJECT RF: *Detection Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
forensics results. Field improved debris diagnostic codes; accelerate design signatures database development and base lining of weapon design analysis capability. - Complete operational characterization of select shape charges in support of WMD defeat technologies. - Complete operational testing of classified defeat capability against specific WMD targets. - Continue update/enhancement and maintenance of Sniper family of data bases. - Complete development of next generation of man portable battery powered X-ray systems for diagnostics of WMD. - Complete development of next generation Timed Delay Firing Device. - Complete development of Next Generation Metal Detector. - Continue Concept of Operations development & Standard Operating Procedures development for more complex Outside the Continental United States (OCONUS) demonstrations for detection, and collection capabilities. - Continue cooperation and acceptance of DTRA developed detection technologies for operational development. - Continue cooperation and acceptance of DTRA developed post nuclear event collection technologies for operational development. - Continue transitioning multiple near term technologies to generate prototypes and design packages to assist ground forces. - Exercise developmental collection capabilities with table top experiment, command post exercise, and field test experiment. - Continue robotic ground sample collection improvements. Begin development of enhanced autonomous/semi-autonomous collection capabilities as well as improved/new collection capabilities (e.g., water). - Continue development techniques, tactics, and procedures of a nuclear forensics ground sample collection team. - Continue development and testing of remote information awareness capability for radiation sensor systems and data integration for increased area of detection capability. - Complete operational characterization of select shape charges in support of Weapons of Mass Destruction (WMD) defeat technologies. - Complete operational testing of classified defeat capability against specific WMD targets. - Continue update/enhancement and maintenance of Sniper family of data bases. - Complete development of next generation of man portable battery powered X-ray systems for diagnostics of WMD. - Complete development of next generation Timed Delay Firing Device.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Investigate capability gaps and opportunities for insertion of technology for treaty monitoring and verification. - Develop experiment to determine the seismic effects of device coupling. - Begin to develop a manufacturing capability for boron and lithium based replacements to helium based neutron detectors.					
FY 2012 Base Plans: - Complete design and fabrication of a prototype passive interrogation system for determining the location and signature of nuclear material. - Continue development of a rugged, mobile stand-off radiation detection system to provide mid to long-range detection and identification of nuclear materials in a field environment. - Complete development and testing of a small, light-weight, low-cost, and low-power real-time secondary dosimeter to provide a single design for the Navy, Army, and Air Force. Continue development on a real-time primary dosimeter providing beta, gamma, and neutron sensitivity. - Continue to develop and demonstrate alternative neutron detection technologies for replacement of helium-3 neutron detectors. - Continue developing and improving high performing microelectronics to determine the location of a radiological source. - Develop, test, verify, assist with validation, and use additions to the Joint Semi-Automated Forces (JSAF) tool intended to provide nuclear detection simulation capability into the JSAF environment, an integrated, accurate, environment where the Concept of Operations (CONOPS) and physics of nuclear detection can be studied in tandem. - Continue to develop, accelerate development where appropriate, demonstrate, and field (prototype) upgraded technical capabilities for prompt diagnostics and debris sample collection, sample analysis, and integration of design modeling and forensic data to support development of technical conclusions. - Continue development of fieldable (integrated and deployable) enhanced/rapid separation, dissolution and analysis laboratory capabilities and prototype novel technologies to shorten the analysis timeline. - Continue development of methods to rapidly determine post-event nuclear weapon yields by investigating alternative prompt nuclear weapons effects, effects on the environment, and developing/fielding prototype capabilities. - Continue robotic air/ground sample collection improvements; complete development and prototype fielding of enhanced semi-autonomous ground and airborne debris collection capabilities in conjunction with completion of the NTNF JCTD.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continue development of a fielded 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 laboratory and field testing. - Complete execution of the National Technical Nuclear Forensics Joint Concept Technology Demonstration (JCTD) and begin Limited Operational Use / Employment and Follow-on Sustainment activities - Continue expanding the functionality of the Mobile Field Kit – Radiological (MFK-R) by increasing radiological situational awareness and mission review to current and future suites of sensors. - Investigate capability gaps and opportunities for insertion of radiation detection technology for treaty monitoring and verification. - Continue transitioning multiple near term technologies to generate prototypes and design packages to assist operational users. - Standoff Operational Exercise (SOX) Range will continue to support standoff experiments with the Photonuclear Inspection and Threat Analysis System (PITAS), a Bremsstrahlung beam generating system. - Establish the Integrated Standoff Inspection System (ISIS) as an Advanced Technology Demonstration. - 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. - Complete execution of the National Technical Nuclear Forensics Joint Concept Technology Demonstration (JCTD) and begin Limited Operational Use / Employment and Follow-on Sustainment activities - Begin systems engineering approach for integration of technologies needed to enhance verification and monitoring of the follow-on to the New Strategic Arms Reduction Treaty (START). - Demonstrate Spiral I of the Arms Control Enterprise System (ACES) that enhances the database for strategic bomber movements and inspection operations. - Initiate Spiral II of ACES that addresses production facilities and weapons transfers. - Complete Phase I near source strong motion-small scale tests and high fidelity analysis for detection and identification of low yield and evasive testing.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Initiate Phase I near source strong motion-small scale tests and high fidelity to address detection of deliberate evasive testing. - Begin exploring technologies for man portable detection and analysis capability for the Fissile Material Cutoff Treaty. - Demonstrate field portable gamma ray and neutron detection system for New and Future START warhead counting and identification. - Start experimental assessment of advanced concepts for warhead counting and assessment for Future START. - Initiate upgrade analysis system for radioactive noble gases to detect underground nuclear explosions for CTBT. - Complete operational characterization of the imaging and high spectral resolution systems for man portable, vehicle borne and stationary radiological detectors. - Begin development of the next generation NIMBLE ELDER network technologies. - Begin operational characterization of the emerging radiological active detection prototypes. - Continue development of the Force protection improvement for NIMBLE ELDER detection equipment. - Continue development of NIMBLE ELDER maritime detection capabilities. - Continue cooperation and acceptance of DTRA developed detection technologies for operational development. - Complete ground robotic sample collection improvements. - Begin transitioning ground robotic sample collection capability to a program of record. - Continue testing and evaluation nuclear forensics sample collection procedures through demonstrations and exercises. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	60.186	90.688	77.784	-	77.784

	FY 2010	FY 2011
Congressional Add: AELED IED Electronic Signature Detection	4.800	-
FY 2010 Accomplishments: - Continued active source technology development and integration with passive capability. - Continued frequency agile source development and integration. - Researched phenomenology for better assessment of target responses to illumination.		

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	FY 2010	FY 2011
- Developed phenomenology for WMD/Improvised Explosive Device (IED) applications for signature detection of WMD/IED triggers. - Developed advanced receiver and algorithm enhancement for detection of evolving signatures to improve Digital Signal Processing (DSP) capability specific to this application and the identification/design of emerging hardware for electronics detection.		
Congressional Adds Subtotals	4.800	-

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
• 22/0602718BR: *WMD Defeat Technologies*	40.556	52.649	50.548		50.548	48.248	48.614	49.926	50.894	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Conduct/support end-to-end National Technical Nuclear Forensics capabilities exercise and supporting demonstration(s).

Successfully develop data integration capability with future interagency comprehensive, all domain weapons of mass destruction detection architecture.

Continue to develop upgraded technologies for sample collection, sample analysis, and data analysis; develop plan for faster diagnostics based on technology demonstrations; formulate program direction for advanced forensic sampling concepts.

Detection standoff distance: handheld identification of 1 kilogram of shielded Highly Enriched Uranium at five meters.

Successful maritime demonstration of neutron sensitive panel detector.

Complete laboratory testing of CZT-based Compton imaging spectrometer.

Successful testing of prototype components of a large area gamma detection system.

Successful completion of the real-time secondary dosimeter project.

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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*	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*	16.688	17.386	15.186	-	15.186	20.631	21.477	21.768	22.442	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Advanced Energetics & Counter WMD Weapons project provides advanced technology development and demonstration for defeating 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. 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 robotics; (2) counter force agent defeat weapons and methods; and (3) disruptive payloads and delivery systems.

The decrease from FY 2011 to FY 2012 is predominately for increased investment for nuclear weapons effects in project RF-Detection Technology and also for program reductions made to comply with Department guidance to identify funds to support higher priority mission areas.

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	16.688	17.386	15.186	-	15.186
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:*** - Supported USAF Quick Reaction Capability Program Massive Ordnance Penetrator validation tests. - Continued development of novel thermal based payloads. - Completed Phase I: Concept Refinement of the Integrated Precision Ordnance Delivery System (IPODS) Program. - Conducted live simulant matrix testing. - Initiated Air Force Research Laboratory (AFRL) risk reduction program for IPODS end-game seeker technology maturation. - Conducted small scale testing and modeling of kinetic and non-kinetic payload capability. - Initiated Modular Autonomous Countering Weapons of Mass Destruction System (MACS) Concept Development trade studies. - Developed advanced wireless sensor capability for DT&E. - Identified MACS critical component technologies. - Completed Kinetic Fireball Analysis of Alternatives and associated critical design review.					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Completed initial High Power Microwave production equipment damage and disruption testing. ***FY 2011 Plans:*** - Complete IPODS concept design and initiate scaled model tests of selected design. - Finalize Modular Autonomous Countering Weapons of Mass Destruction (WMD) System Concept Development Studies and initiate technology maturation efforts. - Evaluate Defense Advanced Research Projects Agency Strategic Hardened Facility Defeat technology maturity. - Continue development of enhancements to Weapons Effects Modeling for Agent Defeat and integrate non-kinetic based Countering WMD capabilities. - Initiate improvements for soft target Countering WMD capability. - Conduct initial full-scale flight test against a multi-story test structure. - Initiate advancements in Bulk Neutralization Payload Development. ***FY 2012 Base Plans:*** - Develop IPODS preliminary Hardware Design and Software Architecture. - Continue development of enhancements to Weapons Effects Modeling for Agent Defeat. - Conduct computerized fit checks on carriage platforms and scale model IPODS wind tunnel testing. - Continue improvements for soft target CWMD capabilities. - Continue AFRL end-game seeker technology maturation testing. - Continue maturing diagnostic capability to meet emerging needs and field improved capabilities. - Initiate development of MACS architecture. - Continue improvements for soft target WMD Defeat capability. - Develop initial MACS prototype. - Integrate Kinetic Fireball sub-munitions into warhead. - Conduct High Power Microwave disruption and forensics testing. - Complete Counter Electronics High Power Microwave Advanced Missile Project (CHAMP) JCTD Operational Utility Assessment against a WMD target. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	16.688	17.386	15.186	-	15.186

Exhibit R-2A, RDT&E Project Justification: PB 2012 Defense Threat Reduction Agency		DATE: February 2011
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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
• 22/0602718BR: *WMD Defeat Technologies*	29.431	29.139	17.115		17.115	14.825	14.935	13.786	13.718	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Percent increase of countering Weapons of Mass Destruction 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
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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*	19.687	14.052	6.985	-	6.985	6.271	6.295	6.277	6.208	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Nuclear Survivability project develops and demonstrates Radiation Hardened Microelectronics (RHM) for nuclear hardening and survivability of Department of Defense's (DoD) systems and provides for the execution of force-on-force evaluations and nuclear weapons surety efforts to enhance the protection of nuclear resources.

The RHM program responds to DoD space and missile system requirements for RHM and photonics technology to support mission needs. This program develops and demonstrates radiation-hardened, high performance prototype microelectronics to support the availability of RHM and photonics for DoD missions from both private sector and government organizations.

Mighty Guardian Force-on-Force Tests aid in satisfying requirements for the Services by providing denial of access to nuclear resources in all environments; operational, storage and in transit. The results of the evaluations identify security vulnerabilities to weapons systems that are then addressed through targeted application of research and development projects requested by the resource owners. These projects are designed to demonstrate, test, and evaluate security enhancement systems prior to service procurement.

Nuclear Weapons Surety, as tasked by the DoD Nuclear Weapon System Safety Program, provides Combatant Commands (COCOMs), Services, and Joint Chiefs of Staff with technical analyses, studies, research, and experimental data necessary to identify and quantify risks of plutonium dispersal and Loss of Assured Safety due to accidents, fires or natural causes during peacetime operations of the nation's nuclear weapon systems. Additionally, this will provide studies necessary to quantify the probability of success against targeted terrorist attacks on DoD facilities, while leveraging these risk assessment advances. It also provides new and innovative technologies for the protection of nuclear resources in support of COCOMs and Services.

The decrease from FY 2011 to FY 2012 in RI Nuclear Survivability is predominately due to the conversion of 0603160BR funding to 0602718BR funding to better reflect the nature of the Radiation Hardened Microelectronics efforts in the RI-Nuclear Survivability budget project. Radiation Hardened 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 toward development and evaluation of technical feasibility.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RI: Nuclear Survivability	19.687	14.052	6.985	-	6.985

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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*	PROJECT RI: *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
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. ***FY 2010 Accomplishments:*** - Completed development of 90nm Static Random Access Memory (SRAM) compiler for use in designing Application Specific Integrated Circuits (ASIC). - Completed initial investigation of 90nm RadHard by process enhancements and developed a baseline for circuit demonstrations - Performed initial characterizations of single event effects in commercial 45nm bulk and silicon-on-insulator technology. - Conducted Mighty Guardian XIII Force-On-Force test to evaluate nuclear security policy as it applies to missile launch facility security at Minot AFB, ND. - Planned Mighty Guardian XIV Force-On-Force test to evaluate bomber generation operations at an Air Force Global Strike Command installation. - Conducted research, development, test, and evaluation on physical security technologies designed to enhance protection of the nuclear stockpile as determined by the Services. ***FY 2011 Plans:*** - Develop mitigation techniques for 45nm Radiation Hardened by Design (RHBD) Technology. - Develop initial Technology Computer-Aided Design modeling for 45nm. - Conduct Mighty Guardian XIV Force-On-Force test at a location to be determined by Global Strike command to evaluate nuclear security policy as it applies to bomber generation. -Plan Mighty Guardian XV Force-on-Force test to evaluate nuclear security policy for waterfront restricted areas and submarines in transit at Naval Base Kings Bay, GA. - Conduct exploratory research on physical security equipment and technology designed to enhance protection of the nuclear stockpile as determined by the Services. ***FY 2012 Base Plans:*** - Develop 90nm RHBD qualification vehicle for ASIC design flow capability. - Continue investigation of 45nm RHBD mitigation techniques on a technology characterization vehicle. - Demonstrate 45nm RHBD Test Circuit Vehicle. - Demonstrate initial 90nm radiation hardened 64Mb Static Random Access Memory (SRAM).					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Conduct Mighty Guardian XV Force-on-Force test to evaluate nuclear security policy for waterfront restricted areas and submarines in transit at Naval Base Kings Bay, GA. - Plan Mighty Guardian XVI Force-on-Force test to evaluate nuclear security policy for Prime Nuclear Airlift Forces (PNAF). - Plan Mighty Guardian XVI Force-On-Force Test to evaluate nuclear security policy as it applies to submarine in transit at a location still to be determined. - Conduct research, development, test, and evaluation on physical security technologies designed to enhance protection of the nuclear stockpile as determined by the Services.					
Accomplishments/Planned Programs Subtotals	19.687	14.052	6.985	-	6.985

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
• 22/0602718BR: *WMD Defeat Technologies*	22.048	17.902	17.503		17.503	17.261	17.388	17.855	18.718	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Achieve Radiation Hardened and Radiation Hardened by Design (RHBD) 90nm Application Specific Integrated Circuit design flow capability.

Successful completion of Mighty Guardian exercises is measured by completing all necessary planning and logistics steps, troops arriving when required, training completed, execution of the exercise, redeployment of forces, and publishing a final report within 90 days of completion.

Successful completion of research, development, test, and evaluation for physical security technologies is determined by performers completing the project on-time and within budget, all stated tasks in the statement of work/objectives being met, proper reporting and coordination of decision areas, receipt of final reports closing out the project, and transitioning the project to the requesting Service.

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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*	33.888	28.260	22.303	-	22.303	20.403	20.727	21.137	21.700	Continuing	Continuing

A. Mission Description and Budget Item Justification

The WMD Battle Management project develops, integrates, demonstrates and transitions emerging/innovative technologies to support the counter Weapons of Mass Destruction (WMD) Mission. This activity specifically focuses on two critical components in countering the WMD threat:

Develop end-to-end planning capabilities including weaponeering tools to aid the Combatant Commander's targeting and weapons officers in choosing the proper weapon, fuze, and employment parameters to optimize the defeat of WMD and related hard targets. Deliver modernized, validated and fast running attack planning tools and integrating software. Leverage attack planning tools to support force protection planners and vulnerability assessment teams.

Develop, integrate, demonstrate and transition emerging/innovative technologies to provide the warfighter with an enhanced near real-time combat and battle damage assessment capability. Capability is achieved through the development of Unmanned Aerial Systems and weapon-based sensors, platforms, taggants, seekers and other innovative technologies to; remotely sense, identify, track and target WMD-related threats; perform battle damage assessment/indication of strikes against these threats; and locate, track, collect, detect, selectively identify, and characterize Chemical Weapon and Biological Weapon aerosol agents released during these WMD counterforce strikes.

The decrease from FY 2011 to FY 2012 is predominately due to program reductions made to comply with Department guidance to identify funds to support higher priority mission areas and program changes for increased investment in detection technologies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RM: WMD Battle Management	33.888	28.260	22.303	-	22.303
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:*** - Conducted Global Strike Battle Damage Assessment (BDA) Phase 2 field demonstration of remote ground and air-based BDA sensors. - Continued development of the WMD Aerial Collection System (WACS). - Identified signatures and establish test beds for sensors to find fix and track WMD related items and people. - Validated and transitioned the near real time Concept of Operations (CONOPS) for Constant Hawk to the warfighter.					

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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*	PROJECT RM: *WMD Battle Management*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Participated in the development of High Altitude Long Endurance Unmanned Aerial Vehicles (UAV) to relay sensor data. - Demonstrated capability to launch and control Flight Inserted Detector Expendable for Reconnaissance (FINDER) UAV from the Predator MQ-1 and conduct AFSOC missions through SATCOM. - Promulgated collaboration and decision support tool solutions into the Defense Threat Reduction Agency (DTRA) Operations Center through identification and procurement of cutting-edge technologies, completion of security accreditation, installation upon approval, and implementation of a comprehensive training program for the user community. - Administered situational awareness solutions into the DTRA Operations Center through an analysis of alternatives of government off-the-shelf and commercial off-the-shelf products for next-generation data analysis and visualization. - Delivered Integrated Munitions Effects Assessment 2010 incorporating JSOW-C planning capability for the Navy and a new capability to calculate WMD release & dispersion from tunnel facilities. - Performed annual cycle of requirements collection, challenge proposals, resource allocation and tech support through High Performance Computing. - Provided Targeting and Weaponeering Analysis Cell academics and targeting support.					
FY 2011 Plans: - Conduct demonstration of the WMD Aerial Collection System. - Validate implemented solutions for command and control, collaboration, decision support, and situational awareness and identify any necessary support base for further enhancement. - Perform integration testing and begin Dynamic Toolset development for Advance Targeting Assessment Capability. - Perform annual cycle of requirements collection, challenge proposals, resource allocation and tech support through High Performance Computing. - Begin development of algorithms for Dynamic Toolset support using High Performance Computing. - Provide Targeting/Weaponeering Analysis Cell academics and targeting support. - Deliver Vulnerability Assessment Protection Option (VAPO) version with Critical Infrastructure Protection modeling and vulnerability analysis. - Commence development of Phase 3 of the Global Strike battle Battle Damage Assessment (BDA) (system optimization). - Design prototype capability for precision delivery of unattended ground sensors from a small UAV.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Enhance Wide Area Aerial Surveillance technology to produce persistent coverage of WMD targets to predict and counter threats from Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE). - Develop, integrate and demonstrate miniaturized CBRNE sensors with radio frequency tags in support of Combating Weapons of Mass Destruction (CWMD) Tag, Track and Locate. - Develop CWMD Persistent Intelligence, Surveillance, and Reconnaissance (P-ISR) integration framework for the fusion of data from multiple sources that provide activity based intelligence. - Complete system assessment and flight test of the Phase 2 Global Strike battle damage assessment system, to include the Chemical, Acoustic, Nuclear and Seismic sensor capabilities, mesh networking with two or more hubs, relay of BDA data via a long haul (satellite) interface and display on a Warfighter Interface. ***FY 2012 Base Plans:*** - Continue to support the Combatant Commands with the further refinement and development of operation center critical technologies that will enhance the capability of rapid response in regards to next generational reach back capabilities. - Conduct demonstration of the WMD Aerial Collection System (WACS). - Conduct Spectre-FINDER Phase 2 Demonstration. - Initiate the transition of WACS prototypes to the U.S. Army. - Develop and demonstrate novel tag technologies for C-WMD Tag, Track and Locate Program. - Complete system assessment of the Phase 2 conventional strike battle damage assessment system, to include the Chemical, Acoustic, Nuclear and Seismic sensor capabilities, mesh networking with two or more hubs, relay of BDA data via a long haul (satellite) interface and display on a Warfighter Interface. - Conduct an operationally representative flight test of a near real-time Battle Damage Assessment (BDA) system for conventional strikes. - Deliver Integrated Munitions Effects Assessment 2012. - Perform annual cycle of requirements collection, challenge proposals, resource allocation and tech support through High Performance Computing. - Provide Targeting and Weaponeering Analysis Cell academics and targeting support. - Continue the effort to integrate first principle modeling codes into GUI-based hazard prediction models. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	33.888	28.260	22.303	-	22.303

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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
• 22/0602718BR: *WMD Defeat Technologies*	15.239	10.899	13.761		13.761	18.569	16.366	17.288	17.693	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Standoff detection range of Weapons of Mass Destruction (WMD) reconnaissance system.

Number of new capabilities delivered to Combatant Commands (COCOMs).

Number of weaponeering solutions delivered to COCOMs.

Increase automation of the analytic process used by Defense Threat Reduction Agency Reachback, DTRA Operations Center and the U.S. Strategic Command Center for Combating WMD.

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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603160BR: *Counterproliferation Initiatives - Proliferation, Prevention and Defeat*	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*	33.097	35.112	32.837	-	32.837	32.014	31.084	31.759	32.429	Continuing	Continuing

A. Mission Description and Budget Item Justification

For some hard and deeply buried targets, physical destruction is neither possible, nor practical, with current conventional weapons and employment techniques. It may be possible, however, to achieve target defeat objectives by denying or disrupting the mission or function of the target facility. Functional defeat, however, requires more information, more detailed analysis of the target. The functional defeat process includes finding and identifying a facility, characterizing its function and physical layout, determining its vulnerabilities to available weapons, planning and executing an attack, assessing damage, and if necessary, suppressing reconstitution efforts and re-attacking the facility. 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 now consists of three subordinate and related activities: (1) Targeting and Intelligence Community Technology Development; (2) Find, Characterize, Assess Technology Development; and (3) the newly added WMD Analysis Cell Technology Support.

The FY 2010 to FY 2011 increase is in support of the Department of Defense (DoD) and Presidential CWMD strategic priorities and will fill critical investment and sustainment gaps across the DTRA CWMD spectrum. This increase is in support of the Counter-WMD Analysis Cell (C-WAC) and will accelerate spiral development and deployment of new modeling capabilities across Nuclear, Biological Warfare (BW) and Chemical Warfare (CW) threat areas, enhancing fusion of R&D and intelligence support for the Combatant Commands.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: RT: Target Assessment Technologies	33.097	35.112	32.837	-	32.837
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: - Delivered Underground Targeting and Analysis System (UTAS) functional process modeling and point mensuration capability to the COCOMs and Intelligence Community. - Fully integrated UTAS modeling capability into the DIA Underground Facility Analysis Center target characterization process and products.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continued to provide target characterization training for the UGF and WMD target defeat communities. - Demonstrated the capabilities of a prototype Integrated Sensor System to support the Underground Facility and Weapons of Mass Destruction (WMD) target characterization and assessment processes of the Combatant Commands (COCOMs) and Intelligence Community. - Demonstrated added Counter-WMD Analysis Cell (C-WAC) capabilities to model and analyze biological weapons threats in support of COCOMs Command and Intelligence Community needs. - Researched and developed models for analysis and assessment of weapons effects on WMD related equipment and systems for use by the Intelligence Community. ***FY 2011 Plans:*** - Add WMD systems and process characterization modeling and assessment capabilities to the UTAS functionality for support of the COCOMs and Intelligence Community targeting and weaponeering requirements. - Fully integrate models for analysis and assessment of weapons effects on WMD related equipment and systems into UTAS for use by the Intelligence Community. - Continue target characterization training for the Underground Facility (UGF) and WMD target defeat communities. - Design, develop and test on-node data fusion to enhance Integrated Sensor System surveillance capabilities for support of Combatant Commands (COCOMs) and Intelligence Community target characterization and assessment needs. - Demonstrate Counter-WMD Analysis Cell (C-WAC) initial capabilities to model and analyze chemical weapons threat development processes in response to COCOMs and Intelligence Community counter WMD requirements. ***FY 2012 Base Plans:*** - Demonstrate Integrated Sensor System (ISS) version 1 capabilities as part of the USNORTHCOM Rapid Reaction Tunnel Detection (R2TD) Joint Concept Technology Demonstration (JCTD). - Demonstrate Integrated Sensor System (ISS) version 1 capabilities as part of the DTRA Counter WMD Technologies Directorate's Integrated Technology Demonstration 1 (ITD-1). - Develop and demonstrate C-WAC integrated counter-WMD strategic analysis capability. - Develop and demonstrate an UTAS version that combines buildings, bunkers and tunnels into a common operating picture (COP) and demonstrate this capability during the DTRA ITD-1. - Demonstrate a UTAS version that integrates analysis of facilities and WMD functional process models.					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
- Continue target characterization training for the UGF and WMD target defeat communities. ***FY 2012 OCO Plans:*** .					
Accomplishments/Planned Programs Subtotals	33.097	35.112	32.837	-	32.837

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
• 22/0602718BR: *WMD Defeat Technologies*	0.486	0.000	0.000		0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Increased WMD target characterization capability thru successful incorporation of WMD systems and process characterization modeling and assessment capabilities into the UTAS functionality.

Remotely determine geotechnical UTAS calculation properties within 35 percent.

Increased analysis of weapons effects on WMD targets thru successful integration of models for analysis and assessment of weapons effects on some WMD related equipment and systems in UTAS by the end of FY 2011.

Demonstrated improved Integrated Sensor System (ISS) on-node data fusion capability.

Improved chemical weapons analysis capability thru Counter-WMD Analysis Cell (C-WAC) modeling and analysis of chemical weapons threat.