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<b>Exhibit R-2, PB 2010 Defense Threat Reduction Agency RDT&amp;E Budget Item Justification</b>								<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research					<b>R-1 ITEM NOMENCLATURE</b> PE 0602718BR WMD Defeat Technologies					
<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	207.448	213.606	219.130						Continuing	Continuing
RA: Systems Engineering and Innovation	50.500	28.342	55.857						Continuing	Continuing
RF: Detection Technology	47.087	39.498	48.073						Continuing	Continuing
RG: Advanced Energetics & Counter WMD Weapons	24.744	30.435	32.381						Continuing	Continuing
RI: Nuclear Survivability	13.063	10.414	18.660						Continuing	Continuing
RL: Nuclear & Radiological Effects	18.784	36.338	19.704						Continuing	Continuing
RM: WMD Battle Management	17.374	29.137	13.240						Continuing	Continuing
RR: Test Infrastructure	15.609	19.986	19.651						Continuing	Continuing
RU: *Fundamental Research for Combating WMD	20.287	19.456	11.564						Continuing	Continuing

**Note**

\*Project title change from Basic Research for WMD Knowledge Gaps starting in FY 2010

**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, Counter Proliferation 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 deter the use of WMD, reduce the present threat and prepare for the future threat. A focused, strong threat reduction technology base is critical to achieving these objectives and is closely tied with the operational

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<p>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.</p> <p>Project RA provides the research and development both for systems engineering and analysis support across all other projects and innovative counter proliferation research and technical reachback support. Increased funding in this project reflects the re-balancing of efforts within the research and development portfolio to enhance corporate systems engineering and innovation to promote high impact, short term, low-risk technology solutions to support the warfighter.</p> <p>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, counter- and non-proliferation, homeland defense, and international initiatives and agreements.</p> <p>Project RG develops advanced technologies and weapon concepts and validates their applicability as counter Weapons of Mass Destruction (WMD) weapon systems.</p> <p>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 re-balancing of efforts within the program element to augment the Radiation Hardened Microelectronics Program and enabling technologies to enhance Nuclear Weapons Effects (NWE) experimentation capability.</p> <p>Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapon effects predictions, and strategic system design decisions. Funding in this project decreased beginning in FY 2010 and reflects a realignment of efforts in NWE nuclear counter proliferation/non proliferation activities and Electromagnetic Pulse survivability modeling efforts.</p> <p>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. Funding in this project decreased beginning in FY 2010 to re-balance efforts in weapons effects, modeling, and reflect the transition of the Biological Combat Assessment System to the WMD Aerial Collection System.</p> <p>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.</p> <p>Project RU provides (1) strategic studies to support DoD, (2) Decision support tools and analyses to support combating WMD research and development investments, and (3) early applied research for technology development. Funding in this project was realigned beginning in FY 2010 to transition decision support tools to Project</p>		

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<b>APPROPRIATION/BUDGET ACTIVITY</b>	<b>R-1 ITEM NOMENCLATURE</b>
0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research	PE 0602718BR WMD Defeat Technologies

RA – Systems Engineering and Innovation. This realignment reflects the re-balancing of efforts to increase corporate capabilities in systems engineering and analysis support across all other projects within the research and development portfolio.

**B. Program Change Summary (\$ in Millions)**

	<b><u>FY 2008</u></b>	<b><u>FY 2009</u></b>	<b><u>FY 2010</u></b>	<b><u>FY 2011</u></b>
Previous President's Budget	211.325	211.078	214.469	
Current BES/President's Budget	207.448	213.606	219.130	
Total Adjustments	-3.877	2.528	4.661	
Congressional Program Reductions	0.000	-0.672		
Congressional Rescissions	0.000	0.000		
Total Congressional Increases	0.000	3.200		
Total Reprogrammings	0.002	0.000		
SBIR/STTR Transfer	-3.879	0.000		
Realignment	0.000	0.000	4.661	

**Congressional Increase Details (\$ in Millions)**

**Project: RU, Center for Nonproliferation Studies**

**Project: RA, Comprehensive National Incident Management System**

	<b>FY 2008</b>	<b>FY 2009</b>
		1.200
		2.000

**Change Summary Explanation**

The increase of funding in the current President's Budget in FY 2010 from the previous President's Budget submission reflects the result of re-balancing efforts within projects to increase funding for systems engineering and innovation efforts to grow the scientific community in support of weapons of mass destruction research.

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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
RA: Systems Engineering and Innovation	50.500	28.342	55.857						Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project provides (1) systems engineering and analysis support across all other Projects, (2) innovative counter proliferation 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 the management of the Research and Development Enterprise to make 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 counter proliferation 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.

Increased funding beginning in FY 2010 reflects the re-balancing of efforts within Program Element 0602718BR for corporate systems engineering and innovation to promote high impact, short term, low-risk technology solutions to support the warfighter.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
RA: Systems Engineering and Innovation	50.500	28.342	55.857	
<i>FY 2008 Accomplishments:</i> <ul style="list-style-type: none"> <li>- Delivered an analysis of the DTRA investments against the identified technology requirements of the agencies program thrusts.</li> <li>- Continued support for the Research and Development Enterprise in requirements and gap analysis to assist program managers identify, conduct, and deliver innovative Science and Technology to combat Weapons of Mass Destruction (WMD).</li> <li>- Completed development of the Arms Control Enterprises System Strategic Module to incorporate nuclear reporting requirements of international treaties, and transition completed module.</li> </ul>				

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Conducted studies and developed systems architectures to enable research and development efforts to meet capability gaps by translating Agency goals and Concept of Operations into actionable products.</li> <li>- Supported transition of successful programs to internal and external organizations to further develop and/or operationalize the technologies.</li> <li>- Collaborated with other innovation organizations across the federal government to further advance innovation capabilities.</li> </ul> <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> <li>- Continue support for the Research and Development Enterprise in requirements and gap analysis to assist program managers identify, conduct, and deliver innovative Science and Technology to combat WMD.</li> <li>- Continue to conduct studies and develop systems architectures to enable research and development efforts to meet capability gaps by translating Agency goals and Concept of Operations into actionable products.</li> <li>- Initiate five new systems engineering based analyses for battle management, situational awareness, medical manufacturing readiness levels, nuclear enterprise, and 21st century technology needs.</li> <li>- Complete and transition innovative projects in threat anticipation, explosives detection, bio-agent sampling for real-time detection, and electronic device detection.</li> <li>- Solicit new innovative research projects.</li> </ul> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> <li>- Initial 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.</li> <li>- 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.</li> <li>- Initial 21st century nuclear threat assessment in support of the Nuclear Posture Review.</li> <li>- Initial Battle Management Architecture and Manufacturing Readiness Level Assessment studies vis a vis the DTRA mission and active projects.</li> </ul>				

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>							<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Initial Nuclear Enterprise architecture analysis.</li> <li>- Initiate three new systems engineering-based special projects.</li> <li>- Receive transition, management and out year funding of decision-support tools from Project RU.</li> <li>- Complete and transition innovative projects in portable neutron sources for nuclear detection and radio systems for use in jamming environments.</li> <li>- Complete and transition micro miniature chemical detector for unattended sensors.</li> <li>- Solicit new innovative research projects.</li> </ul>										
<b>C. Other Program Funding Summary (\$ in Millions)</b>										
	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
26/0603160BR/Prolifeation Prevention and Defeat	22.844	6.372	5.394						Continuing	Continuing
<b>D. Acquisition Strategy</b>										
Not Applicable										
<b>E. Performance Metrics</b>										
Number of customer requests for data analysis compared to historical level.										
Number of changes to investments based on systems engineering analyses.										
Number of exercise and operations supported.										
Number of Defense Acquisition Workforce Improvement Act certified systems engineers.										
New capabilities delivered and transitioned to operational capabilities.										

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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
RF: Detection Technology	47.087	39.498	48.073						Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This 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, counter- and non-proliferation, 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; post-detonation National Technical Nuclear Forensics 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.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
RF: Detection Technology	47.087	39.498	48.073	
<p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> <li>- Developed integrated detection systems exploiting advances in solid state nuclear detectors, processing electronics, analysis software, identification technology, and integrated nuclear/biological/chemical sensor technology, eliminating the logistical burden of cryogenic cooling as well as bulky gas detectors.</li> <li>- Completed a Joint Capability Technology Demonstration (JCTD) effort demonstrating a modular nuclear radiation detection system capable of being mounted on multiple platforms (vehicular, aerial, marine, and handheld) and being deployed in both overt and covert situations and that can be seamlessly integrated into a sensor network to provide battle space awareness for the theater commander. This JCTD should result in transitioning a viable modular nuclear detection system to Combatant Commands.</li> <li>- Completed development of a baseline Department of Defense large standoff Bremsstrahlung active interrogation system to provide a reference standard for evaluating progress and capabilities in standoff detection and warning of hidden and shielded nuclear material.</li> </ul>				

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Demonstrated standoff detection of nuclear material in a field environment. Stimulated fissions in nuclear material from 300 meters standoff using a Bremsstrahlung x-ray generator.</li> <li>- Executed evaluation of distributed sensor systems, their communications, and their signal processing to support a prioritized development program of networks for defense, security and tracking.</li> <li>- Conducted/supported end-to-end exercise/demonstration of global National Technical Nuclear Forensics capabilities.</li> <li>- Developed sensors to detect Weapons of Mass Destruction (WMD) threats as far forward as possible and in all operational environments. Developed the capability to integrate data with future interagency comprehensive, all-domain WMD detection architecture from collection to dissemination.</li> <li>- 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.</li> <li>- Maintained the Domestic Nuclear Event Attribution (DNEA) legacy and development of National Technical Nuclear Forensics thru monthly notification drills, quality assurance/quality control testing, and successfully conducted three table top exercises and five Field Training Exercises (FTX), the last being an external evaluation. The last FTX demonstrated a limited ground collection capability.</li> <li>- Improved the ANDROS robot via several modifications to improve range and ability to perform improved sampling, maneuverability, logistic requirements, and communications.</li> <li>- Developed Concept of Operations (CONOPS) and Standard Operating Procedures for ground sample collection.</li> <li>- Successfully transitioned DNEA legacy lab CONOPS and support to Department of Energy (DOE).</li> <li>- Successfully co-funded the development of DOE nuclear event device modeling and nuclear event characterization database.</li> <li>- Enhanced/maintained the Sentry/Sniper databases. Integrated chemical and biological weapon information and a decision matrix into a comprehensive WMD database.</li> <li>- Continued hardware and software improvements based on laboratory and user training sessions for the Hand Held Chemical Detector for Special Operation Forces. Began development at a library suite consisting of Chemical Warfare Agents, precursor, and Homemade Explosives.</li> </ul>				

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Developed equipment that is waterproof, shockproof and resistant to extreme conditions and sustained employment without significant operational degradation. Developed smaller, lighter-weight detection systems for more adverse field employment.</li> <li>- Successfully transitioned eight near-term nuclear detection technologies to generate prototypes and design packages to assist ground forces.</li> </ul> <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> <li>- Continue program for developing integrated detection systems exploiting advances in solid state nuclear detectors, processing electronics, analysis software, identification technology, and integrated nuclear/biological/chemical sensor technology.</li> <li>- Initiate a full scale test and evaluation campaign for Compton imagers and a second generation effort to develop more integrated and compact imagers with enhanced capability. These second generation imagers will be more optimized to operate with an active excitation source directed at the target item.</li> <li>- Continue program to develop systems that enable consequence management, to include the protection of forces.</li> <li>- 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.</li> <li>- Continue the extensive effort begun in the Joint Capability Technology Demonstration (JCTD) to integrate solid state detectors, communications, and processors into a robust self-configuring sensor network for detecting, identifying, and tracking nuclear materials in transit.</li> <li>- Continue to develop 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.</li> <li>- Develop technical information to support programmatic decisions regarding next-generation ground sampling capabilities, marine sampling capability, and next-generation Unmanned Aerial Systems for air and ground sampling. Support potential development/conduct of a Nuclear Forensics JCTD.</li> </ul>				

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Continue to 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.</li> <li>- Commence an initial JCTD effort demonstrating portable stand off Bremsstrahlung active interrogation system capable of being mounted on an aerial platform that can be seamlessly integrated into a bi-static or mono-static detector network to provide battle space awareness for hidden and shielded nuclear material for the theater commander. This JCTD should result in transitioning a viable stand off active interrogation system to Combatant Commands.</li> <li>- Demonstrate active interrogation as a safe method of stand off detection in situations where dosage to people and cargo are below the allowable limits.</li> <li>- Continue cooperation and acceptance of Research and Development Enterprise developed detection technologies for operational development.</li> <li>- Continue cooperation and acceptance of Research and Development Enterprise developed post nuclear event collection technologies for operational development.</li> <li>- Continue transitioning multiple near term technologies to generate prototypes and design packages to assist ground forces.</li> <li>- Exercise developmental collection capabilities with table top experiment, command post exercise, and field test experiment.</li> <li>- Continue enhancement/maintenance of the Sentry/Sniper databases. Integrate chemical and biological weapon information and a decision matrix into a comprehensive Weapons of Mass Destruction database.</li> <li>- Continue robotic ground sample collection improvements.</li> <li>- Continue development techniques, tactics, and procedures of a nuclear forensics ground sample collection team.</li> <li>- Conduct modeling, simulation and experiments to evaluate the feasibility of using muons and protons to stimulate fissions in nuclear materials from standoff ranges.</li> </ul> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> <li>- Complete design for a baseline Department of Defense large standoff proton active interrogation system to provide a reference standard for evaluating progress and capabilities in standoff detection and warning of hidden and shielded nuclear material.</li> </ul>				

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>							<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Continue the extensive effort begun in the stand off Bremsstrahlung active interrogation system Joint Capability Technology Demonstration to develop a stand off active interrogation system to detect hidden and shielded nuclear material.</li> <li>- 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.</li> <li>- 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.</li> <li>- 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.</li> </ul>										
<b>C. Other Program Funding Summary (\$ in Millions)</b>										
	<u><b>FY 2008</b></u>	<u><b>FY 2009</b></u>	<u><b>FY 2010</b></u>	<u><b>FY 2011</b></u>	<u><b>FY 2012</b></u>	<u><b>FY 2013</b></u>	<u><b>FY 2014</b></u>	<u><b>FY 2015</b></u>	<u><b>Cost To Complete</b></u>	<u><b>Total Cost</b></u>
26/0603160BR/ Proliferation Prevention and Defeat	38.140	46.357	66.977						Continuing	Continuing
<b>D. Acquisition Strategy</b> N/A										
<b>E. Performance Metrics</b>										
Successful completion of laboratory testing of the helium dimer Compton imager.										
Successful completion of the individual digital dosimeter project.										
Increase standoff detection distance using a mobile active interrogation system to stimulate characteristic neutron and gamma ray signals from nuclear material.										

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<p>Successful acceptance and operational development of transitional detection technologies.</p> <p>Successful demonstrations of a ground sampling forensics capability to support attribution involving both Radiological Dispersal and Improvised Nuclear Devices.</p> <p>Deliver 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.</p> <p>Improve forensics tool capabilities.</p> <p>Support development of a National Technical Nuclear Forensics (NTNF) capability 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.</p> <p>Sustain readiness via lab exercises and Quality Control and Quality Assurance processes. Conduct successful separate collection exercises specific to DoD NTNF mission.</p> <p>Support completion of the DoD Directive promulgating DoD support to the National Technical Forensics Program. Draft strategic Concept of Operations for the Commander, U.S. Strategic Command Center for Combating Weapons of Mass Destruction that addresses post-detonation NTNF operational response.</p> <p>Continue to maintain/enhance the Sentry/Sniper databases and assist in populating the Sniper Chemical and Biological database.</p>		

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<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research				<b>R-1 ITEM NOMENCLATURE</b> PE 0602718BR WMD Defeat Technologies					<b>PROJECT NUMBER</b> RG	
<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
RG: Advanced Energetics & Counter WMD Weapons	24.744	30.435	32.381						Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This 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 also focuses on accelerating the development of advanced energetics technology (highly novel chemical and non-chemical energy systems), integrating disruptive payloads and technologies into existing and next generation weapon systems, developing a Hard and Deeply Buried Target (HDBT) bunker buster capability that produces a threshold of five-fold in defeat capability over current bunker buster capability by FY 2009, ten-fold over current capability by FY 2013 and providing 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) counter force weapons, fuzing technology, and robotics; (2) counter force agents and methods; and (3) disruptive payloads and delivery systems.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
RG: Advanced Energetics & Counter WMD Weapons	24.744	30.435	32.381	
<p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> <li>- Continued development of technologies for counterforce agent defeat, advanced payloads, counter WMD payload delivery systems, and advanced counter WMD weapons.</li> <li>- Conducted flight demonstration tests of the Massive Ordnance Penetrator to demonstrate it's capability against HDBTs.</li> <li>- Continued Integrated Precision Ordnance Delivery System (IPODS) previously known as Precision Large Payload Delivery Concept Development and Preliminary Design supporting a ten-fold increase of Combating WMD weapon effectiveness over fielded weapons.</li> <li>- Conducted IPODS design concepts.</li> <li>- Completed non-kinetic based capabilities concept studies.</li> <li>- Began non-kinetic payload development for functional defeat of WMD targets.</li> <li>- Conducted Advanced Fuzing sled tests.</li> </ul>				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009		
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> <li>- Continue development of technologies for counterforce agent defeat, advanced payloads, counter Weapons of Mass Destruction (WMD) payload delivery systems, and advanced counter WMD weapons.</li> <li>- Develop non-kinetic based counter-WMD process modeling capability and integrate it into High Level Architecture backbone.</li> <li>- Conduct survey, analysis and down-select of non-kinetic test beds, models and capabilities.</li> <li>- Complete sub-scale testing of Sandia National Lab 3 axis digital data recorder.</li> <li>- Complete integration/testing of Insensitive Munitions Agent Defeat Bomb, Live Unit-109 Payload.</li> <li>- Complete Counter WMD Deny Payload component test.</li> <li>- Continue scale tunnel lethality tests on promising high-energy fills.</li> <li>- Continue Integrated Precision Ordnance Delivery System design, refinement of concepts, technology assessments, Concept of Operations, and downselect.</li> </ul> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> <li>- Complete Scaled High Speed Penetration Tests vs. Limestone Geological Targets.</li> <li>- Initiate High Speed Penetrator case/fill material development and characterization.</li> <li>- Support Hard Target Void Sensing Fuze full-scale Joint Capability Technology Demonstration survivability testing.</li> <li>- Complete fuze booster cup survivable recorder development.</li> <li>- Conduct Joint Direct Attack Munition Battle Damage Information system full-scale technology development.</li> <li>- Begin integration of kinetic and non-kinetic capabilities into single payload for counter-WMD.</li> <li>- Begin testing of novel high explosive materials developed under disruptive payloads technology.</li> <li>- Conduct small scale testing and modeling of non-kinetic payload capability.</li> </ul>					

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>		<b>DATE:</b> May 2009
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research	<b>R-1 ITEM NOMENCLATURE</b> PE 0602718BR WMD Defeat Technologies	<b>PROJECT NUMBER</b> RG

**C. Other Program Funding Summary (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<b>Cost To Complete</b>	<b>Total Cost</b>
26/0603160BR/ Proliferation Prevention and Defeat	20.029	20.550	21.396						Continuing	Continuing

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

Number of large scale tests completed.

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

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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
RI: Nuclear Survivability	13.063	10.414	18.660						Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Nuclear Survivability Technology Project (NSTP) 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 and Electromagnetic Pulse. The NSTP provides Radiation Hardened Microelectronics and Nuclear Weapons Effects (NWE) experimentation capabilities. Funding in this project also supports the expanding role of the Nuclear Test Personnel Review program into Science & Technology development.

The Simulation Technology area is operating under a new business model for the West Coast Facility, San Leandro, CA, that makes it a 100% customer funded facility. These 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 and the international Weapon Effects Steering Committee (WESC) that was called the NWE Users' Group. The WESC establishes standards for 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.

Funding in this project reflects the re-balancing of efforts within the research and development portfolio to augment the Radiation Hardened Microelectronics Program and enabling technologies to enhance the NWE experimentation capability.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
RI: Nuclear Survivability	13.063	10.414	18.660	
<i>FY 2008 Accomplishments:</i>				
- Completed dismantlement of the Decade simulator at the Arnold Engineering Development Center.				
- Initiated new business model for the West Coast Facility (WCF) simulator with a no-cost contract.				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research		<b>R-1 ITEM NOMENCLATURE</b> PE 0602718BR WMD Defeat Technologies		<b>PROJECT NUMBER</b> RI	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<ul style="list-style-type: none"> <li>- Completed initial experiments on transfer of WCF cold and warm x-ray capabilities to the Saturn machine at Sandia National Laboratory (SNL).</li> <li>- Supported joint x-ray source demonstration and Nuclear Weapons Effects (NWE) experiments on the OMEGA laser at Department of Energy Laboratory for Laser.</li> </ul> <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> <li>- Characterize the warm x-ray sources at the WCF using a time-resolved camera from the United Kingdom Atomic Weapons Establishment.</li> <li>- Conduct cold and warm x-ray source experiments on Saturn.</li> <li>- Initiate research &amp; development for enabling technology to improve small experimentation capability for high fidelity gamma effects and model validation.</li> <li>- Research and publish beta-particle radiation dose probabilistic uncertainty analysis.</li> </ul> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> <li>- Demonstrate final Radiation Hardened by Design 90 nanometer (nm) reconfigurable Field-Programmable Gate Array.</li> <li>- Complete disposition of excess government-owned WCF equipment.</li> <li>- Complete a joint x-ray source and effects demonstration experiment at the National Ignition Facility with SNL, Lawrence Livermore National Laboratory, United Kingdom Atomic Weapons Establishment, and the Missile Defense Agency.</li> <li>- Develop new, enabling technologies for improved NWE experimentation capabilities for x-rays, gamma rays, and neutrons.</li> <li>- Development of modeling for prompt radiation environment in urban settings, noting in particular canyon effects and shielding by structures.</li> </ul>					

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>		<b>DATE:</b> May 2009
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research	<b>R-1 ITEM NOMENCLATURE</b> PE 0602718BR WMD Defeat Technologies	<b>PROJECT NUMBER</b> RI

**C. Other Program Funding Summary (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<b>Cost To Complete</b>	<b>Total Cost</b>
25/0603168BR/ Proliferation Prevention and Defeat	21.432	18.654	13.935						Continuing	Continuing

**D. Acquisition Strategy**

N/A

**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.

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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
RL: Nuclear & Radiological Effects	18.784	36.338	19.704						Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Nuclear and Radiological Effects 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 (GIG), 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 Combatant Commands and Department of Defense.

Efforts in the areas of advanced modeling systems and survivability technology are re-balanced to increase corporate capabilities in systems engineering and analysis support across all other projects within the research and development portfolio. The impacts delay full 3-D modeling and simulation efforts for electromagnetic pulse (EMP) response and consequence management predictions, to include second and third order effects.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
RL: Nuclear & Radiological Effects	18.784	36.338	19.704	
<p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> <li>- Enhanced and developed models allowing the predictions and analysis of nuclear survivability for military communication satellites, the power grid as supporting the GIG, and the Army's Future Combat System.</li> <li>- Continued to provide nuclear electromagnetic hardening and survivability support to the Joint Staff, Defense Information Systems Agency and Missile Defense Agency. Focus areas anticipated include the Nuclear Command and Control System and GIG.</li> <li>- Continued the high altitude nuclear weapon detonation data review in support of High Altitude EMP modeling.</li> <li>- Continued technical revisions to Redbook Volumes I-IV, Effects Manual-1, and further publishing of Joint Radiation Effects documentation.</li> </ul>				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009	
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research	<b>R-1 ITEM NOMENCLATURE</b> PE 0602718BR WMD Defeat Technologies		<b>PROJECT NUMBER</b> RL	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Continued to develop and integrate baseline database of 80% of current foreign nuclear infrastructure facilities into targeting and hazard prediction codes.</li> <li>- Continued improvement of modeling of nuclear facility vulnerability and human response to nuclear weapons effects. Significantly improved modeling of transport of radiological materials and disposition from nuclear events.</li> <li>Developed prototype capability to model radiation transport from an Improvised Nuclear Device in an urban environment.</li> </ul> <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> <li>- Continue to provide nuclear electromagnetic hardening and survivability support to the Joint Staff, Defense Information Systems Agency (DISA), and Missile Defense Agency (MDA). Focus areas anticipated include the Nuclear Command and Control System and Global Information Grid (GIG).</li> <li>- Complete development and integration of the electromagnetic pulse (EMP) prediction model and low equivalent dose radiation cancer algorithms.</li> <li>- Assess EMP effects on power grid components to determine impacts to the Department of Defense's GIG.</li> <li>- Continue technical revisions to Redbook Volumes I-IV, Effects Manual (EM)-1, and further publishing of Joint Radiation Effects documentation.</li> <li>- Continue development of models allowing the predictions and analysis of nuclear survivability for military communication satellites.</li> <li>- Begin Air Conductivity Experimentation and Advanced HANE Engineering Code Development efforts.</li> </ul> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> <li>- Continue to provide nuclear electromagnetic hardening and survivability support to the Joint Staff, DISA, and MDA. Focus areas anticipated include the Nuclear Command and Control System and GIG.</li> <li>- Continue development of models allowing the predictions and analysis of nuclear survivability for ballistic missile defense system.</li> <li>- Provide small scale testing in support of modeling and simulation (M&amp;S) validation.</li> <li>- Continue EM-1 development; integrate activities to include validation and verification, peer review, and coordination with experimentation efforts; continue publication of Joint Radiation Effects documentation.</li> </ul>				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>							<b>DATE:</b> May 2009			
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>							<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
- Validate 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.										
<b>C. Other Program Funding Summary (\$ in Millions)</b>										
	<u><b>FY 2008</b></u>	<u><b>FY 2009</b></u>	<u><b>FY 2010</b></u>	<u><b>FY 2011</b></u>	<u><b>FY 2012</b></u>	<u><b>FY 2013</b></u>	<u><b>FY 2014</b></u>	<u><b>FY 2015</b></u>	<u><b>Cost To Complete</b></u>	<u><b>Total Cost</b></u>
115/0605000BR/WMD Defeat Capabilities	15.291	15.896	8.735						Continuing	Continuing
<b>D. Acquisition Strategy</b> N/A										
<b>E. Performance Metrics</b> 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.										

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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
RM: WMD Battle Management	17.374	29.137	13.240						Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project provides applied research to support full and sub-scale testing required investigating counter Weapons of Mass Destruction (WMD) weapon effects, sensor performance, and weapon delivery optimization; 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 target increases. It develops new and enhanced capabilities at DTRA's WMD National Test Beds for integrating WMD defeat testing Department of Defense (DoD) wide and supports tests and demonstrations of new capabilities for the counter WMD offensive operations mission area. It develops, tests, and demonstrates innovative and optimized HDBT Defeat weapon delivery methods, leading to the Services implementation of optimized conventional weapon Tactics, Techniques and Procedures into warfighter operations. 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 counter WMD tools, Integrated Munitions Effects Assessment (weaponing) and Vulnerability Assessment and Protection Option (force/structure protection).

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.

Funds were realigned from this project as a result of the Agency decision to fund the 6.1 Basic Research program at the DoD investment goal of 10-12% of Total Obligation Authority. Efforts in this project were re-balanced to increase corporate capabilities within Project RA - Systems Engineering and Innovation. Subprograms impacted are Weapons Effects Planning Tools, WMD Technology, and Counter WMD Weapons Effects modeling/testing. Planned tests supporting blast mitigation projects and recapitalization of test beds are delayed. Risk reduction testing is scaled back and technology demonstrations are reduced.

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>	
<p>RM: WMD Battle Management</p> <p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> <li>- Enhanced modeling of Chemical and Biological effects on human entities and integrate Defense Threat Reduction Agency (DTRA) models with next-generation U.S. Army Chemical, Biological, Radiological and Nuclear (CBRN) simulation federates in experimentation.</li> <li>- Provided CBRN defense solutions for Joint Concept Development &amp; Experimentation experiment focused on examining potential solutions to joint/combined urban operations challenges and multi-national collaboration to include Joint Forces Command Multi-National Experiment.</li> <li>- Integrated Agency technologies into the DTRA Experimentation Lab to provide capabilities demonstration and testing in support of experimentation, demonstration events, and to validate proof-of-concept solutions.</li> <li>- Initiated formal agreement between U. S. Strategic Command, U. S. Joint Forces Command and DTRA in support of a Combating WMD (CWMD) Experimentation Enterprise.</li> <li>- Established the Ultra High Performance Concrete response characteristics investigation plan. Conducted scaled penetration tests.</li> <li>- Initiated exploration of synthetic and virtual world application with intelligence communities to CWMD mission.</li> <li>- Completed testing and model development for multi-hit attacks to hardened bunker buster slabs. Assembled test plan and began testing on hardened bunker roof slabs.</li> <li>- Provided near/mid/long-term stand-off detection technology reviews for Combatant Commands and Service customers; prioritized best near-term capability investment recommendations.</li> <li>- Developed an improved high explosive equation-of-state, accounting for late-term burn during detonations in enclosed spaces, to improve high-fidelity calculations of quasi-static pressure (constrained pressure due to internal detonations). Conducted testing in full scale structure to validate computer model.</li> <li>- Conducted agency-wide Continuity of Operations Table-Top Experiment, identified process and resource shortfalls, and recommended comprehensive solutions.</li> </ul>	17.374	29.137	13.240		

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R-1 Line Item #20

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009	
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Facilitated U. S. European Command Foreign Consequence Management Functional Needs Analysis Workshop in support of a Doctrine, Organization, Training, Materiel, Leadership and education, Personnel and Facilities change recommendation.</li> <li>- Initiated efforts to complete the Weapons of Mass Destruction (WMD) Agent Release Model.</li> <li>- Improved Tunnel Air Blast model to reduce error in the vicinity of tunnel intersections by 90%.</li> <li>- Delivered Improved Ground shock Vulnerability Number capability to Defense Intelligence Agency and U.S. Strategic Command to replace exist one dimensional vulnerability assessment models with fast-running two dimensional models for strategic targeting.</li> </ul> <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> <li>- Conduct Advanced High Performance Concrete material analysis and update weapons effects models.</li> <li>- Complete testing and model development for multi-hit attacks to hardened bunker roof slabs.</li> <li>- Deliver 15 additional validated equipment fragility models.</li> <li>- Complete Quasi Static Pressure testing and modify model.</li> <li>- Conduct testing and modeling improvements to the WMD Agent Release Model. Finalize validation and verification wet agent release.</li> <li>- Complete structural response model for columns subjected to high explosive devises closer than 'scaled range' of 3, but not touching the column.</li> <li>- Complete testing to improve the column structural response model for high explosive devises directly touching columns (satchel charges).</li> <li>- Conduct blast door model testing and model modifications.</li> <li>- Continue research and development supporting counter WMD weapons effect modeling &amp; testing and the Defense Threat Reduction Agency (DTRA) Experimentation Lab.</li> <li>- Conduct defeat demonstration of multi-story building with basement bunker using available air-delivered weapons and U.S. Air Force tactics, techniques, and procedures.</li> <li>- Implement multiple security levels across DTRA information domains to increase effectiveness of the DTRA Experimentation Lab.</li> <li>- Continue to provide leading technological integration capabilities to the combating WMD mission through utilization of the DTRA Experimentation Lab (DEL).</li> </ul>				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research		<b>R-1 ITEM NOMENCLATURE</b> PE 0602718BR WMD Defeat Technologies			<b>PROJECT NUMBER</b> RM	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Continue to support demonstrations and experimentation events for the counter WMD Community of Interest to include participation in Noble Resolve, Coalition Warrior Interoperability Demonstration, Urban Resolve, and Campaign X experimentation campaigns.</li> <li>- Continue facilitation of the internal Continuity of Operations Table Top Experiment through the DEL.</li> </ul> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> <li>- Conduct Ultra High Performance Concrete penetration tests and material analysis. Continue modeling.</li> <li>- Complete model for multi-hit attacks to hardened bunker roof slabs. Finalize or re-direct multi-hit research efforts.</li> <li>- Deliver 15 additional validated equipment fragility models.</li> <li>- Complete Quasi Static Pressure model.</li> <li>- Conduct testing and modeling improvements to the Weapons of Mass Destruction (WMD) Agent Release Model with emphasis on dry agents.</li> <li>- Complete column satchel charge model.</li> <li>- Conduct blast door model testing and model modifications.</li> <li>- Complete progressive collapse model.</li> <li>- Continue to provide leading technological integration capabilities to the combating WMD mission through utilization of the Defense Threat Reduction Agency (DTRA) Experimentation Lab (DEL).</li> <li>- Continue to support demonstrations and experimentation events for the Counter WMD Continuity of Interest to include participation in Noble Resolve, Coalition Warrior Interoperability Demonstration, Urban Resolve, and Campaign X experimentation campaigns.</li> <li>- Continue facilitation of the internal Continuity of Operations Table Top Experiment through the DEL.</li> </ul>						

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>								<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research				<b>R-1 ITEM NOMENCLATURE</b> PE 0602718BR WMD Defeat Technologies				<b>PROJECT NUMBER</b> RM		
<b>C. Other Program Funding Summary (\$ in Millions)</b>										
	<u><b>FY 2008</b></u>	<u><b>FY 2009</b></u>	<u><b>FY 2010</b></u>	<u><b>FY 2011</b></u>	<u><b>FY 2012</b></u>	<u><b>FY 2013</b></u>	<u><b>FY 2014</b></u>	<u><b>FY 2015</b></u>	<u><b>Cost To Complete</b></u>	<u><b>Total Cost</b></u>
26/0603160BR/ Proliferation, Prevention and Defeat	36.198	55.621	31.939						Continuing	Continuing
<b>D. Acquisition Strategy</b>										
N/A										
<b>E. Performance Metrics</b>										
Percent confidence in engineering models.										
Percent confidence in assessment solutions.										
Number of targets successfully planned.										
Time require to complete assessments.										
The DTRA DEL is occupied by planning or execution efforts 75% of the year.										

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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
RR: Test Infrastructure	15.609	19.986	19.651						Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This 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. 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 DoD and supports the counter proliferation pillar of the National Strategy to Combat WMD.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
RR: Test Infrastructure	15.609	19.986	19.651	
<p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> <li>- Continued to upgrade and integrate facilities and support personnel from the Technical Evaluation Assessment Monitoring Site.</li> <li>- Continued research and development activities for test and technology support, infrastructure development and improvement, and environmental restoration of sites and return of the sites to host facilities.</li> <li>- Completed Cultural Resource Assessment and seven of seven site studies (Nevada Test Site).</li> <li>- Improved test infrastructure by acquiring state of the art instrumentation, to include: Digital Direct Shear Machine, updated Global Positioning System, Global Information System, and a Vertical Wind Profiler.</li> <li>- Continued with environmental remediation of the Nevada Test Site.</li> </ul>				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009	
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Continued to acquire microwave systems to remotely operate and monitor the instrumentation systems, transmit and receive video and data, control timing and firing, transmit and receive Voice Over Internet Protocol, and control and receive data from the Remote Instrumentation Platform.</li> <li>- Conducted nuclear detection and forensics testing for the Department of Homeland Security, Domestic Nuclear Detection Office (DNDO), in accordance with the Defense Threat Reduction Agency (DTRA)-DNDO Memorandum of Agreement.</li> </ul> <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> <li>- Continue research and development activities for test and technology support, infrastructure development and improvement, and environmental restoration of sites and return of the sites to host facilities.</li> <li>- Complete classified test bed at Dugway Proving Grounds.</li> <li>- Complete Federal Facilities Agreement and Consent Order compliance.</li> <li>- Acquire a mobile command post capability for the Chestnut test site at Kirtland Air Force Base, NM.</li> <li>- Enhance our test infrastructure to provide support, as required, for chemical-biological sending test events.</li> </ul> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> <li>- Dismantle and environmentally remediate Large Test Structure (LTS)-2 and begin replacement setup for LTS-2 to support an integrated Counter Weapons of Mass Destruction (WMD) Technologies Directorate demonstration in FY 2012.</li> <li>- Begin designing and procurement of a add on structure for Component Test Structure-3 for structural stress tests with Singapore.</li> <li>- Conduct nuclear detection and forensics testing for the Nuclear Technology Directorate.</li> <li>- Conduct nuclear detection and forensics testing for the Department of Homeland Security, DNDO in accordance with the DTRA-DNDO Memorandum of Agreement.</li> <li>- Conduct WMD sensor testing at the Technical Evaluation Assessment and Monitor Site (TEAMS); provide infrastructure upgrades for TEAMS.</li> <li>- Continue environmental remediation and compliance activities at the Nevada Test Site, Dugway Proving Grounds, White Sands Missile Range and Kirtland Air Force Base Chestnut Site.</li> </ul>				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009	
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
- Continue infrastructure and instrumentation upgrades to ensure test beds meet customers' advanced technology testing needs.				
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A				
<b>D. Acquisition Strategy</b> N/A				
<b>E. Performance Metrics</b> 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.				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>									<b>DATE:</b> May 2009	
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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
RU: *Fundamental Research for Combating WMD	20.287	19.456	11.564						Continuing	Continuing

**Note**

\*Project title change from Basic Research for WMD Knowledge Gaps starting in FY 2010

**A. Mission Description and Budget Item Justification**

This project (1) conducts strategic studies to support Department of Defense (DoD), (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 focuses increasing the stability and utility of mid-to-long term, moderate risk but high payoff science and emerging technologies for transition 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 is re-balanced to transition the decision support tools efforts into Project RA - Systems Engineering and Innovation to enhance corporate capabilities across all projects.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
RU: Fundamental Research for Combating WMD	20.287	19.456	11.564	
<i>FY 2008 Accomplishments:</i>				
- Conducted strategic study supporting the update and publication of the DTRA Strategic Planning Guidance.				
- Initiated pilot program to support DoD effort to utilize a web-based system for research proposal submission, evaluation and status reporting.				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009	
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Provided technical expertise and advice to generate the 17 new basic research topics.</li> <li>- Identified and transitioned all suitable investigatory Science and Technology research and development projects to appropriate long-term sponsors for concept/design validation, prototype fabrication, testing, and fielding.</li> <li>- Initiated a testbed for promising technologies to quantify and mitigate large area nuclear effects on systems, networks and equipment.</li> <li>- Initiated seven "bridging" projects for early applied development of counter Weapons of Mass Destruction (WMD) technologies.</li> <li>- Initiated efforts to establish a capability to facilitate transition of fundamental science to applied research and development.</li> <li>- Continued the sponsorship and education of the "Next Generation" of mission-critical scientific, technical and engineering expertise.</li> <li>- Continued examination of emerging technologies and underlying sciences applicable to combating WMD, with increased emphasis on avoiding technical surprise.</li> </ul> <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Identify and conduct strategic studies addressing challenges in reducing the threat from WMD.</li> <li>- Exercise testbed to assess promising technologies to quantify and mitigate large area nuclear effects on systems, networks and equipment.</li> <li>- Continue seven "bridging" projects for early applied development of counter WMD technologies.</li> <li>- Initial 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.</li> <li>- Continue to provide technical expertise and advice to generate the new basic research topics in support of the semi-annual solicitation.</li> <li>- Initiate a Mentor program and continue the sponsorship and education of the "Next Generation" of mission-critical scientific, technical and engineering expertise.</li> </ul>				

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<b>Exhibit R-2a, PB 2010 Defense Threat Reduction Agency RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009			
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>- Continue examination of emerging technologies and underlying sciences applicable to combating WMD, with increased emphasis on avoiding technical surprise.</li> </ul> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> <li>- Transition decision support tools with current and outyear funding to Project RA - Systems Engineering and Innovation.</li> <li>- Identify and conduct strategic studies addressing challenges in reducing the threat from WMD.</li> <li>- Continue to exercise the testbed to assess promising technologies to quantify and mitigate large area nuclear effects on systems, networks and equipment.</li> <li>- Complete seven “bridging” projects for early applied development of counter WMD technologies, initiate transition to appropriate long-term sponsors for concept/design validation, prototype fabrication, testing, and fielding.</li> <li>- Final operational capability for pilot program to support Department of Defense (DoD) effort to utilize a web-based system for research proposal submission, evaluation and status reporting.</li> <li>- Continue to provide technical expertise and advice to generate the new basic research topics in support of the semi-annual solicitation.</li> <li>- Continue examination of emerging technologies and underlying sciences applicable to combating Weapons of Mass Destruction (WMD), with increased emphasis on avoiding technical surprise.</li> <li>- Initiate new “bridging” projects for early applied development of counter WMD Technologies.</li> <li>- Continue the mentoring, sponsorship, and education of the “Next Generation” of mission-critical scientific, technical and engineering expertise.</li> </ul>						

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<b>C. Other Program Funding Summary (\$ in Millions)</b>										
	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<b>Cost To Complete</b>	<b>Total Cost</b>
1/0601000BR/ Fundamental Research for Combating WMD	14.708	22.329	48.544						Continuing	Continuing
<b>D. Acquisition Strategy</b> N/A										
<b>E. Performance Metrics</b> 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.  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.										

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