

Exhibit R-2, RDT&E Budget Item Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

R-1 ITEM NOMENCLATURE:

WMD Defeat Technology; 0602716BR

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total 0602716BR Cost	185.1	245.5	206.5	216.2	219.1	224.5	232.0	237.4
Project BB Small Business Innovative Research*	0	0	2.3	2.4	2.4	2.4	2.4	2.4
Project BD Weapons Effects Technologies	65.4	67.5	73.6	75.3	75.5	76.9	78.7	80.6
Project BE Testing Technologies & Integration	14.1	13.4	24.7	22.6	22.4	22.9	22.8	22.0
Project BF CP Operational Warfighter Support	44.2	91.2	94.2	98.1	100.4	103.8	107.5	110.0
Project BG Nuclear Operations	61.4	73.4	11.7	17.8	18.4	18.5	20.6	22.4

*In year of execution, funding executed under PE 0605502BR "Small Business Innovative Research"

A. Mission Description and Budget Item Justification:

The Defense Threat Reduction Agency (DTRA) is working to make the world safer by reducing the present threat and preparing for future threats. Weapons of mass destruction (WMD) (chemical, biological, radiological, nuclear and high explosives) are the most serious threats our nation and its allies face today. This mission directly reflects several national and DoD-level documents to include the National Military Strategy, support to the War on Terrorism (WOT), the dictates of the Quadrennial Defense Review (QDR), the Nuclear Posture Review (NPR), changes to the Unified Command Plan (UCP), the implementation of the Defense Transformation Planning Guidance (TPG) and is specifically directed by the Joint Chiefs of Staff (JCS) in the Joint Strategic Capabilities Plan (Nuclear Annex). To achieve this mission, DTRA has identified principal objectives along with strategies and tasks to ensure the objectives are met. Three of these objectives are to deter/defeat 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 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 as delineated in the TPG. Technologies being developed support one or more of the Joint Functional Concepts (JFC) being refined during implementation of the Joint Capabilities Integration and Development System (JCIDS).

DTRA is the Department of Defense (DoD) focal point for programs and activities to reduce the threats posed by WMD proliferants. New, forward-thinking activities have been identified and prioritized to support the DTRA mission and the DoD Counterproliferation (CP) strategy for responding to the full spectrum of crises and preparing now for an uncertain future. The WMD Defeat Technology programs support national guidance, the DTRA strategic vision, and Service and Combatant Command operational customers.

This program element provides the innovative technologies and concepts underpinning all counterproliferation programs. It includes special equipment development, exploration of new technologies, necessary facilities, test bed operations, and all other associated costs in support of the development of the technology base needed to support the defeat of current and future WMD. Initiatives supported include, but are not limited to, such activities as follow:

- Supporting civil and military response to WMD use;

Exhibit R-2, RDT&E Budget Item Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	R-1 ITEM NOMENCLATURE: WMD Defeat Technology; 0602716BR	

- Developing technologies and operational concepts to search, locate, diagnose and defeat Weapons of Mass Destruction WMD terrorism in the form of improvised explosive devices (IEDs) such as: Improvised Nuclear Devices (INDs) or Radiological Dispersal Devices (RDDs), and to provide a capability to rapidly attribute a domestic nuclear event;
- Examining U.S./Allied capabilities to hold at risk all enemy targets, including hardened, deeply buried targets at risk; evaluating capabilities against known or projected potential targets; and evaluating new technologies for possible application against known shortfalls;
- Providing warfighters with physical and functional vulnerability assessments of hostile foreign systems;
- Developing technologies and capabilities to find and characterize underground facilities and assess battle damage to underground targets;
- Developing WMD analysis and simulation tools for the warfighter including target planning and assessment; hazardous materials transport and collateral effects prediction; consequence assessment; and antiterrorism/force protection;
- Developing and applying state-of-the-art nuclear weapons effects models to support nuclear weapon stewardship and system hardiness design;
- Developing, improving and engineering the unique DoD test and simulation facilities (to include infrastructure) and enabling technologies that are used to evaluate the impact of hostile environments from conventional, nuclear, and other special weapons on military or civilian systems or targets.

WMD Defeat Technology projects comprise a critical component of the ability of the Department to meet the technology challenges posed by the emerging international environment and the National Military Strategy. The coverage of the projects ranges from counterterrorism through conventional conflict through countering WMD threats. As part of its commitment to support the Combatant Commanders and to provide them the best capability to counter/mitigate the WMD threat, DTRA manages and funds several R&D programs to look over the horizon and exploit/develop current/emerging technologies that will deter/prevent, detect, locate, defeat, mitigate and allow forensic attribution of existing/future WMD threats/devices.

In addition, the Advanced Systems and Concepts Office (ASCO) develops and maintains an evolving analytical vision of necessary and sufficient capabilities to protect the United States and allied forces and citizens from nuclear, biological, and chemical (NBC) attack. ASCO is also charged with identifying gaps in these capabilities and initiating programs to fill them.

Exhibit R-2, RDT&E Budget Item Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, Defense-Wide/Applied Research - BA2

R-1 ITEM NOMENCLATURE:
WMD Defeat Technology; 0602716BR

B. Program Change Summary:

(\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget	184.1	249.8	259.0	257.8
Current President's Budget	185.1	245.5	206.5	216.2
Total Adjustments	1.0	-4.3	-52.5	-41.6
Congressional program reduction				
Congressional reductions		-6.1		
Congressional increases		4.0		
Reprogrammings	3.0			
Classified Program Transfer			-53.0	-53.0
Other Program Adjustments			.5	11.4
SBIR/STTR Transfer	-2.0	-2.2		

Change Summary Explanation:

- The decrease in the FY 2004 funding profile from the previous President's Budget to the current President's Budget is the result of a SBIR funding transfer and below-threshold reprogrammings. During the year of execution, SBIR funding (-\$2.0 million) is consolidated into PE 0605502BR "Small Business Innovative Research" for execution. DTRA also completed a below-threshold reprogramming in support of the Advanced Systems and Concepts Office, Threat Anticipation Program (TAP) (+\$1.2 million) from PE 0602717BR; reprogrammed funds from PE 0602717BR and PE 0603160BR to support Nevada Test Site Remediation (+\$2.6 million); and reprogrammed inflation savings within the Department of Defense (-\$.8 million).
- The net decrease in FY 2005 from the previous President's Budget to the current President's Budget is the result of the FY 2005 DoD Appropriation Bill (P.L. 108-287) that contained several undistributed congressional reductions that were proportionally applied to the entire DTRA RDT&E program. This program received a -\$6.1 million reduction. This program received Congressional adds in the amount of \$4.0 million. Additionally, SBIR funding (-\$2.2 million) was consolidated into PE 0605502BR "Small Business Innovative Research" for execution.
- The decrease in FY 2006 from the previous President's Budget to the current President's Budget primarily reflects the transfer of a classified program. DTRA's priority development is strongly linked to the Combatant Commanders. Funding is used to support high priority combat support requirements in accordance with current planning, assumptions and associated requirements, correct infrastructure deficiencies and implement the business reform initiative. It also balances the program consistent with strategic priorities both within DTRA and the Department of Defense.
- The decrease in FY 2007 from the previous President's Budget to the current President's Budget primarily reflects the transfer of a classified program. DTRA's priority development is strongly linked to the Combatant Commanders. Funding is used to support high priority combat support requirements in accordance with current planning, assumptions and associated requirements, correct infrastructure deficiencies and implement the business reform initiative. It also balances the program consistent with strategic priorities both within DTRA and the Department of Defense.

Exhibit R-2, RDT&E Budget Item Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	R-1 ITEM NOMENCLATURE: WMD Defeat Technology; 0602716BR	

- The resulting program provides for a flexible combat support structure; focused science and technology investments, to include such critical areas as WMD target defeat and nuclear weapons effects technologies; defeat Weapons of Mass Destruction WMD weapons/devices, enhanced consequence management capabilities; force protection, infrastructure protection and dual-use homeland security initiatives; as well as the streamlining and transformation of the supporting business practices and workforce.

C. Other Program Funding Summary: see Exhibit R-2a

D. Acquisition Strategy: N/A

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

PROJECT NAME AND NUMBER:

Project BB - Small Business Innovative Research (SBIR)

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project BB – Small Business Innovative Research (SBIR)	0	0	2.3	2.4	2.4	2.4	2.4	2.4

A. Mission Description and Budget Item Justification:

This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of DoD supported research and development results. These efforts are responsive to PL 106-554.

B. Accomplishments/Planned Program:

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Small Business Innovative Research (SBIR)	0	0	2.3	2.4

FY 2004 Accomplishments

- In year of execution, funding executed under PE 0605502BR “Small Business Innovative Research”
- Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.
- Execute Agency-approved SBIRs.

FY 2005 Plans

- In year of execution, funding executed under PE 0605502BR “Small Business Innovative Research”
- Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.
- Execute Agency-approved SBIRs.

FY 2006 Plans

- Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.
- Execute Agency-approved SBIRs.

FY 2007 Plans

- Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.
- Execute Agency-approved SBIRs.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BB - Small Business Innovative Research (SBIR)

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: N/A

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project BD – Weapons Effects Technologies	65.4	67.5	73.6	75.3	75.5	76.9	78.7	80.6

A. Mission Description and Budget Item Justification:

- Project BD provides the research and development underpinning for the next generation of agent defeat, deny and disrupt counterforce weapon development and application of products and services to meet Weapons of Mass Destruction (WMD) and other special weapons effects challenges using state-of-the-art science and engineering capabilities, including advanced first principles analysis, engineering modeling, simulation and networking technologies, novel payload development and evaluation capability, and precision laboratory scale and field testing capabilities (supported by Project BE-Testing Technologies and Integration). This project will develop an over-arching framework for all Chemical, Biological, Radiological, Nuclear and high Explosive (CBRNE) related modeling and simulation tools as well as the next generation of counterforce agent defeat, deny, and disrupt operational capability. Initially, the focus of the modeling component will be on producing the Integrated WMD Toolset (IWMDT) that will provide Department of Defense (DoD) users access to valid WMD tools in a consistent fashion and provide for standardized Configuration Management (CM) and Verification, Validation and Accreditation (VV&A) of all included model components and systems. The counterforce Agent Defeat (AD) weapon component will initially pursue two tracks, one focused on extending the lethality of agent defeat payloads to include a persistent constituent in both the plume and near debris field and a second on developing the advanced diagnostic capability required for both sub- and full-scale evaluations of these payloads. Subsequent efforts will focus on the development of deny payloads and payloads with a specific interaction with ISR assets for improved post attack assessment capability. Initiatives supported by this project include, but are not limited to, such activities as follow:
 - Integrating and applying advanced capabilities to improve decision making effectiveness in the face of rapidly evolving WMD threats in both military and civilian sectors. Products being developed include CBRNE target planning and assessment tools, CBRNE hazardous materials transport and collateral effects prediction tools, tools and technologies to mitigate and assess the effects of hazardous material on facilities and people, and consequence assessment/management tools to evaluate and respond to such events. Models and tools developed support Project BK-Counterforce in PE 0603160BR, Proliferation Prevention Defeat
 - Developing technologies to support force protection assessments, forensic analysis of terrorist events and advanced blast mitigation/retrofit techniques. Tools developed in this project support other projects including Project BC-Force Protection and Technology Applications in PE 0602717BR, WMD Defense Technologies, and Project BF-CP Operational Warfighter Support, as well as civilian, antiterrorism and disaster response support organizations;
 - Developing and validating Chemical/Biological Warfare (CBW) defeat and disrupt weapon effectiveness and collateral release diagnostics for the Hard and Deeply Buried Target (HDBT), Weapons of Mass Destruction (WMD) facility testbeds;
 - Providing, maintaining and applying the weapons of mass destruction technology base. The technology base applies expertise developed originally for nuclear weapon detonation(s) phenomenology (subsurface through exo-atmospheric), the evolution of the resulting disturbed environment, and the effects of that environment on systems. The expertise has expanded to all weapons of mass destruction. This is

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

accomplished by providing weapons effects technology and information to U.S. and Allied weapon systems developers, government planners, operators, doctrine authors, and decision makers;

- Developing the next generation of thermal based Agent Defeat payloads for inclusion in both direct and stand-off munitions;
 - Developing novel payloads that can effectively defeat complex agent targets combinations of both Biological Weapons (BW) and Chemical Weapons (CW) agents
 - Developing and maintaining the technical capability to predict the impact of the effects of weapons of mass destruction on all aspects of warfighting, to include communications, radar and optical sensor systems and to support DoD components in the analysis and prediction of the response of systems that must operate in nuclear and naturally disturbed environments.
-
- An integral component of this project is the provision of access to state-of-the-art high-performance computing (HPC) machines, high-speed connectivity, and superior technical support to DTRA researchers nationwide.
 - DTRA is the Department of Defense center of excellence for nuclear weapon burst phenomenology and the resulting interaction with military and civilian systems. Starting with weapon output calculations, DTRA develops the tools for predicting the subsequent evolution of all nuclear weapon induced effects including the blast and shock interactions for low-altitude, surface and sub-surface nuclear explosions; electromagnetic pulse (EMP); prompt, delayed, and trapped radiation; plasma and radioactive debris history. These efforts rely on ready access to high-performance computing (HPC) resources to enable the efficient solution of the resultant large-scale numerical simulations.
 - DTRA shares a stewardship responsibility with the special weapons related defense community to maintain the Nation’s core nuclear competencies and to successfully pass on this knowledge base and critical skills to the next generation of defense oriented scientists, engineers and weapon system developers. This is provided through the Knowledge Application project, a tight integration of three efforts - Defense Threat Reduction Information Analysis Center (DTRIAC), Data Archival and Retrieval Enhancement (DARE), and Graybeard – dedicated to the collection and preservation of the data and knowledge derived during more than 50 years of nuclear weapons effects testing and studies; and a fourth effort, the Knowledge Applications component, that capitalizes on the expertise derived from these three programs by applying it to current Agency technical programs. Today this research is based on simulations and high fidelity calculations requiring correlation with this "legacy" data for validation.
 - Assist in the development of a National Center for Blast Mitigation which will comprise of predictions of blast effects on structures, development of blast mitigation/protection techniques, the development of forensic techniques to obtain intelligence and aid in policy making and strategic decisions in the areas of building codes and safe perimeter certification.

B. Accomplishments/Planned Program:

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Targeting Support	20.0	16.6	15.5	16.3

FY 2004 Accomplishments

- Provided instrumentation for the tunnel target test series in Ladenburg, addressing dry chemicals in containers with baseline weapons in support of Project BF-CP Operational Warfighter Support.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

- Provided automated access to the technology contained within the Design and Analysis of Hardened Structures to Conventional Weapons Effects (DAHS CWE) manual through incorporation of the data and methods into Protective Structure Automated Design System (PSADS).
- Developed an Integrated Weapons of Mass Destruction Toolset (IWMDT) prototype for the combatant commands to use for operational implementation of the new technology that will provide access to DTRA targeting support tools to the warfighter via the Secret Internet Protocol Router Network (SIPRNET) and Joint Worldwide Intelligence Communications System (JWICS).
- Began the changes to the architecture of the Integrated Munitions Effects Assessment (IMEA) tool to fit into the Integrated Weapons of Mass Destruction Toolset (IWMDT) framework.
- Improved the kinetic reaction parameters for agent defeat modeling by including the Passive Attack Weapon (PAW) in the Integrated Munitions Effects Assessment (IMEA) software tool to support Project BF-CP Operational Warfighter Support.
- Delivered a nuclear module and additional capabilities in the buildings, bunkers, and tunnels modules in IMEA v.5.0.
- Updated the Penetration Curve (PENCRV) model with IMEA to run faster and to incorporate small weapon penetration predictions. High-velocity penetration test data will be used to develop and validate a penetration model for emerging high-velocity weapons.
- Began development of a PC-based force protection tool, VAPO (Vulnerability Assessment and Protection Option,) leveraging the extensive weapons effects models developed for IMEA. This application will focus on providing DTRA assessment teams with a single tool to assist in their missions of improving the defensive posture of U.S. assets.
- Completed assessment of the potential consequences of terrorists using volatile fuels as weapons. Methodologies to estimate potential blast pressures and associated damage to buildings were developed.
- Developed reinforced concrete column retrofit to mitigate the effect of satchel threats and reduce potential for progressive collapse.
- Initiated testing and model development for steel frame structures. Results will be incorporated into the IMEA and VAPO tools.
- Began development of a PC-based tool to more accurately predict blast effects on structures in urban settings. The tool will be integrated into the Vulnerability Assessment and Protection Option (VAPO), and Integrated Munitions Effects Assessment (IMEA) tools and will be used to develop blast mitigation solutions and to conduct forensic studies.
- Delivered Integrated Theatre Engagement Model (ITEM) with updated amphibious capability.

FY 2005 Plans

- Deliver enhanced weapons systems and modeling capabilities, including a multi-hit module, Response Surface Mapping (RSM), improved site visualization capabilities, blast door model, equipment fragility model, and tunnel airblast model with IMEA version 6.0.
- Validate the high-velocity penetration model for implementation in IMEA version 7.0
- Extend the penetration model to handle small scale projectile penetration into concrete.
- Develop additional lethality/vulnerability models for damage from enhanced lethality weapons (i.e. high temperature incendiaries).
- Improve cratering models to account for detonations completely below burster slabs.
- Validation of sub-scale cylindrical cased charge fragmentation test data by comparison to similar full scale tests

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

PROJECT NAME AND NUMBER:

Project BD– Testing Technologies and Integration

- Deliver explosive blast, chemical and biological hazards mission protection capabilities in VAPO version 1.0 for use by the Joint Service Integrated Vulnerability Assessment (JSIVA) Community.
- Deliver an Integrated Weapons of Mass Destruction Toolset (IWMDT) capability that provides planning and assessment capability for conventional and nuclear targeting along with WMD analysis for net centric warfare.
- Complete testing of steel frame structures and initiate model development.
- Commence study on blast effects on wood and steel stud construction. Conduct tests to determine extent of damage and potential for progressive collapse.
- Deliver ITEM with an initial Weapons of Mass Destruction (WMD) Impact Capability.

FY 2006 Plans

- Perform tests to validate improved cratering models for weapons detonating below a burster slab (flexural failure).
- Develop probability-based analytical techniques for evaluating the residual resistance function of structural components subsequent to loadings.
- Conduct experiments to predict bridge target defeats with fragment producing weapons against reinforced/prestressed concrete and steel bridge components.
- Improve weaponeering models against underground urban systems that can be used by the enemy for counteroffensive troop movements.
- Improve penetration models based on test data from full scale tests.
- Implement penetration data from tests of weapons against multi-story buildings to improve weaponeering methods against these targets.
- Deliver Vulnerability Assessment and Protection Option (VAPO) version 2.0, with nuclear and radiological hazards mission protection capabilities, to expand its user base to include the Balanced Survivability Assessment (BSA) community.
- Deliver IMEA 7.0 with enhanced penetration and cratering models, as well as updated nuclear prediction capabilities.
- Integrate advanced payload models into Integrated Munitions Effects Assessment (IMEA) weapons database.
- Update tunnel reconstitution model with test data gathered from DIVINE HELCAT.
- Implement enhanced Underground Targeting and Analysis System (UTAS) network-wide functional defeat and special operations planning and target visualization functionality in Integrated Munitions Effects Assessment IMEA/UTAS tool.
- Integrate portal extension engineering response model in IMEA 7.0.
- Complete model development for steel frame and wood and steel stud structures.
- Integrate advanced capabilities of targeting support, consequence assessment and consequence management into the Integrated Weapons of Mass Destruction Toolset (IWMDT) Net-Centric architecture.
- Deliver an enhanced IWMDT capability that provides Net-Centric operational integration of Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance, (C4ISR) common operating picture, and intelligence with a robust Chemical, Biological, Radiological, Nuclear, and High Explosives, (CBRNE) web-browser and web-services capability for the spectrum of operations

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

from conventional to Chem-Bio and extending to nuclear analysis.

- Deliver Integrated Theatre Engagement Model, (ITEM) with a complete Weapons of Mass Destruction, (WMD) impact capability.

FY 2007 Plans

- Deliver Munitions Effects Assessment Version 8.0 with new collateral effects and modeling information for new weapon systems.
- Perform small-scale demonstration tests to validate data from large-scale tests of reactive structural materials.
- Begin model development for Non-Energetic Advanced Payload Fills integration for use in conventional Bomb Live Unit (BLU)-109 and Mark (MK)-84 munitions.
- Perform simulations to validate WMD operational defeat demonstrations using the Facility 3 testbed.
- Integrate data from testing and demonstrations at the egress denial testbed into functional defeat models.
- Conduct blast testing and methodology development to fill gaps identified in the development of the DoD Security Engineering Manual.
- Initiate development of fast-running airblast model for complex geometries.
- Initiate development of comprehensive curtain wall design methodology.
- Initial integration of sensor/sensor model capability.
- Fully integrate 4D visualization, sequencer, infrastructure, interdependence, radio frequency, mitigation/remediation and high altitude nuclear effects, initial integration of unconventional munitions.
- Fully integrate capability to model effects of Weapons of Mass Destruction (WMD) employment in a Joint Theatre Campaign.
- Theatre Engagement Model, Integrated Theatre Engagement Model (ITEM) has fully integrated multi-user interface and remote access capability.
- Fully integrate Integrated Weapons of Mass Destruction Toolset (IWMDT)/Nevada architecture into Global Information Grid (GiG) and Network-Centric Enterprise Services (NCES) providing broader Chemical/Biological/Radiological/Nuclear/High Explosive (CBRNE) support to warfighter.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Environments	15.2	16.7	21.7	22.3

(Re-titled in FY 2005 from Nuclear Phenomenology)

FY 2004 Accomplishments

- Completed initial calculations to understand and establish bounds for selected uncertainties in “first principle” codes.
- Completed initial modeling of Global Positioning System (GPS) operation in a nuclear environment.
- Continued dissemination of nuclear effects predictions and system interaction tools to DoD users.
- Provide nuclear weapons effects tools for Strategic Command (STRATCOM) and Missile Defense Agency (MDA) functions.
- Initiated development of an advanced 3-Dimensional Near Surface Effects Computational System for unique effects assessments including structures, transportation infrastructure and Weapon of Mass Destruction (WMD) hazardous agents.
- Initiated advanced combined effects simulation system for near surface low-yield nuclear effects in city (terrorist use of nuclear weapons).
- Initiated the incorporation of nuclear-weapon-in-city analysis into fast-running algorithms for Hazard Prediction and Assessment Capability/Consequence Assessment Tool Set (HPAC/CATS).
- Completed the validation of the nuclear and non-nuclear Electromagnetic Pulse tools developed for STRATCOM.
- Populated the Electromagnetic Pulse (EMP) Tools with test databases.
- Delivered Strategic Command, Control, Communications, Connectivity Assessment Tool (STRATCAT) tool for STRATCOM.
- Completed the Full Operational Capability (FOC) for the Strategic C4 Assessment Tool (STRATCAT) tool for STRATCOM.
- Continued work on Volume 2 of Redbook and output from terrorist devices.
- Carried out analysis of effects of low-yield nuclear weapon in modern city.
- Quantified enhanced agent kill mechanism.
- Completed initial experiments and modeling of enhanced nuclear agent defeat.
- Completed initial technical reviews of new textbook on nuclear weapon effects, comments incorporated into new draft.

FY 2005 Plans

- Calculate weapon output for improvised nuclear devices to better characterize future potential threats.
- Continue work on Volume 2 of Redbook and output from terrorist devices.
- Refine methods for bio-agent defeat by persistent effects in nuclear fireballs and incorporate as tool in Integrated Weapons of Mass Destruction Toolset (IWMDT).
- Develop weapon system-specific characterization of radioactive weapon debris for use in fallout modeling.
- Demonstrate high-fidelity dispersion of materials in urban areas.
- Continue development of an advanced 3-Dimensional Near Surface Effects Computational System for unique effects assessments including

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

structures, e.g., buildings, bunkers, etc., transportation infrastructure, e.g., subways, bridges, etc., and Weapon of Mass Destruction (WMD) agents.

- Continue advanced combined effects simulation system for near surface low-yield nuclear effects in city (terrorist use of nuclear weapons).
- Continue the incorporation of nuclear-weapon-in-city analysis into fast-running algorithms for Hazard Prediction and Assessment Capability/Consequence Assessment Tool Set (HPAC/CATS).
- Develop concepts and tools to employ enhanced biological agent kill mechanism.
- Provide annual High Altitude Nuclear Effects Prediction Tool Workshop and delivery of Advanced System Survivability Integrated Toolkit (ASSIST) 2005
- Support US STRATCOM General Group 05 (GG05) War Game exercise and provide Survivability Planning and Intercept Evaluation Tool - DTRA (SPIET-D) engagement prediction tool.
- Conversion of the "integrated Space Weather Prediction Model Input Signal Management, (ISM) to run on massively parallel computers
- Initiate second round of technical reviews of new textbook on nuclear weapon effects.
- Finalize Project Graybeard by incorporating Project results in Data Archival and Retrieval Enhancement (DARE) Complete initial "Global" capability for SCENARIO Tool family and begin "Global" capability modifications for Nuclear Optical and Radar Systems Effects (NORSE) system tool family.
- Begin transitioning the high altitude nuclear effects modeling and simulation codes into the Nuclear Capabilities Server to meet an integrated, net centric interoperable system.

FY 2006 Plans

Provide annual High Altitude Nuclear Effects Prediction Tool Workshop and delivery of Advanced System Survivability Integrated Toolkit (ASSIST) 2006.

- Maintain support to US STRATCOM and other commands/agencies for their use of Survivability Planning and Intercept Evaluation Tool - DTRA (SPIET-D) and the Advanced System Survivability Integrated Toolkit (ASSIST) toolkit.
- Carry out initial computations of the Input Signal Management (ISM) with a nuclear burst source term.
- Deliver Full Operational Capability (FOC) nuclear cloud lofted dust module for Strategic Command (STRATCOM).
- Continue development of "Global" capability for all high altitude nuclear weapon effects prediction tools.
- Accomplish the integration of an advanced 3-Dimensional Near Surface Effects Computational System for unique effects assessments including structures, e.g., buildings, bunkers, etc., transportation infrastructure, e.g., subways, bridges, etc., communication systems, e.g., towers and connectivity and distribution structures, transportation infrastructure, e.g., subways, bridges, etc., and Weapons of Mass Destruction (WMD) devices or agents.
- Develop an advanced combined effects simulation system for near surface low-yield nuclear effects in city (terrorist use of nuclear weapons).
- Accomplish advanced beta testing of the incorporation of nuclear-weapon-in-city analysis into fast-running algorithms for Hazard Prediction and Assessment Capability/Consequence Assessment Tool Set (HPAC/CATS) or other DTRA fast running codes for the Warfighter.

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

PROJECT NAME AND NUMBER:

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

Project BD– Testing Technologies and Integration

- Develop updated modeling and simulation capability of sub-surface nuclear burst environments and phenomenology.
- Continue transitioning High Altitude Nuclear Effects (HANE) systems codes to Nuclear Capability Server (NuCS).

FY 2007 Plans

- Improve and update stockpile (Blue Book) and foreign nuclear warhead radiation output models (Red Book) using 2-D and 3-D computations to provide greater precision.
- Provide annual High Altitude Nuclear Effects Prediction Tool Workshop and delivery of Advanced System Survivability Integrated Toolkit (ASSIST) 2007.
- Maintain support to US STRATCOM and other commands/agencies for their use of Survivability Planning and Intercept Evaluation Tool - DTRA (SPIET-D) and the Advanced System Survivability Integrated Toolkit (ASSIST) Toolkit.
- Continue transitioning High Altitude Nuclear Effects system codes to Nuclear Capability Server.
- Complete development of "Global" capability for all high altitude nuclear weapons effects prediction tools.
- Carry out initial computations of the ISM with beta radiation trapping, loss, and transport mechanism.
- Provide independent support and validation of engineering development and testing of Earth Penetrator technology.

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Hazard Prediction and Assessment Capability (HPAC)/Consequence Assessment	17.8	15.5	14.9	15.3

FY 2004 Accomplishments

- Completed Hazard Prediction and Assessment Capability, (HPAC) 4.04 with industrial facility and transportation hazard release and urban atmospheric transport capabilities.
- Completed data synthesis, archive, and began conducting scientific validation of urban dispersion model using data from FY 2003 full-scale urban test.
- Completed initial development of enhanced radiological decay in HPAC.
- Initiated development of water transport model in collaboration with US Navy. Water transport model will encompass rivers, ports, and oceans (littoral region).
- Continued assessment of littoral-region mesoscale weather forecasting model performance and implement recommended improvements.
- Initiated development of Chemical, Biological, Radiological, Nuclear, High Explosive, (CBRNE) Decision Support Tool to assist Combatant Commands, Services, and installation commanders with consequence management planning and decision-making.
- Delivered initial validated capability of interior building hazard transport model to Northern Command (NORTHCOM) and service organizations.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

- Integrated weather data from multiple sources and format for use in HPAC to provide operational hazard predictions that more fully account for uncertainty in weather observations and forecasts.
- Provided technical and operational support to OSD, Joint Staff, and Combatant Command contingency operations and exercises as required.
- Continued integration of hazard prediction tools into OSD Joint Effects Module Block 1.
- Continued to support Global Information System, GIS-based infrastructure and web-based technologies in support of integrated Weapons of Mass Destruction (WMD) planning and assessment tools and systems.

FY 2005 Plans

- Complete HPAC 4.05. Provide full Hazard Prediction and Assessment Capability/Consequence Assessment Tool Set (HPAC/CATS) functionality for Integrated WMD Toolset (IWMDT), a web-based access to all consequence assessment tools.
- Complete restricted version of HPAC 4.05 to meet Strategic Command's (STRATCOM) consequence of execution requirements.
- Complete validation of urban dispersion modeling capability using data from FY 2003 full-scale urban test.
- Initiate integration of population movement (day and night) and evacuation algorithms with casualty estimation models.
- Link Hazard Prediction and Assessment Capability (HPAC's) atmospheric transport to the Oak Ridge National Laboratory's Hydrologic Transport Assessment System (HYTRAS) water borne transport model via US Navy funded support of the United States Coast Guard (USCG) homeland security - counterterrorism mission in rivers and estuarine areas (littoral region).
- Continue development of water transport model in collaboration with US Navy.
- Continue littoral-region mesoscale weather forecasting model development.
- Continue development of Chemical/Biological/Radiological/Nuclear/High Explosive (CBRNE) Decision Support Tool to assist Combatant Commands, Services, and installation commanders with consequence management planning and decision making.
- Expand capability of interior building hazard transport model to include buildings and data of interest for Northern Command (NORTHCOM) and service organizations.
- Complete linkage of Air Force Combat Climatology Center climatological weather server to HPAC weather data servers for general user access.
- Continue to provide integrated weather data from multiple sources for use in HPAC to provide operational hazard predictions that more fully account for uncertainty in weather observations and forecasts.
- Provide technical and operational support to OSD, Joint Staff, and combatant command contingency operations and exercises as required.
- Initiate integration of hazard prediction tools into OSD Joint Effects Module Block 2.
- Integrate military medical planning capability Nuclear-Biological-Chemical (NBC) Casualty and Resource Estimation Support Tool in coordination with the US Army Office of the Surgeon General.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY	PROJECT NAME AND NUMBER:	
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

FY 2006 Plans

- Initiate development of economic and environmental assessment algorithms/methods resulting from nuclear or radiation contamination.
- Complete littoral-region mesoscale weather forecasting and demonstrate integrated capability.
- Continue to integrate all consequence assessment tools and functionality for Integrated WMD Toolset (IWMDT).
- Continue integration of population movement (day and night) and evacuation algorithms with casualty estimation tools.
- Integrate improved water transport models in collaboration with the US Navy.
- Continue development of CBRNE Decision Support Tool to assist Combatant Commands, Services, and installation commanders with consequence management planning and decision making.
- Continue to provide integrated weather data from multiple sources for use in Hazard Prediction and Assessment Capability (HPAC) to provide operational hazard predictions that more fully account for uncertainty in weather observations and forecasts.
- Continue integration of hazard prediction tools into OSD Joint Effects Module Block 2.
- Integrate infectious disease models into consequence assessment tools.
- Provide technical and operational support to OSD, Joint Staff, and combatant command contingency operations and exercises as required.

FY 2007 Plans

- Continue to integrate all consequence assessment tools and functionality for Integrated WMD Toolset (IWMDT).
- Continue development of Chemical/Biological/Radiological/Nuclear/High Explosive (CBRNE) Decision Support Tool to assist Combatant Commands, Services, and installation commanders with consequence management planning and decision making.
- Complete development of economic and environmental assessment algorithms/methods resulting from nuclear or radiation contamination.
- Continue integration of population movement (day and night) and evacuation algorithms with casualty estimation tools.
- Integrate improved water transport models in collaboration with the US Navy.
- Integrate chemical kinetics into models based on test data from Air Force Research Lab.
- Initiate Smoke and Obscurants model to estimate degradation of combat targeting and reconnaissance systems.
- Complete integration of infectious disease models into consequence assessment tools.
- Continue to provide integrated weather data from multiple sources for use in Hazard Prediction and Assessment Capability (HPAC) to provide operational hazard predictions that more fully account for uncertainty in weather observations and forecasts.
- Continue integration of hazard prediction tools into OSD Joint Effects Module Block 3.
- Provide technical and operational support to OSD, Joint Staff, and combatant command contingency operations and exercises as required.

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Advanced Systems and Concepts Office (ASCO)	9.3	9.9	8.8	9.0

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

PROJECT NAME AND NUMBER:

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

Project BD– Testing Technologies and Integration

FY 2004 Accomplishments

- Performed systems analysis studies to predict new Weapons of Mass Destruction (WMD) threats.
- Stimulated, identified, and executed high-impact projects to address long-term resolution of Weapons of Mass Destruction (WMD) issues.
- Provided long-range analytical support to the warfighter.
- Developed architectures and capabilities to reduce current and emerging threats.
- Emphasized crosscutting integration and alternative thinking and strategies.

FY 2005 Plans

- Continue systems analysis studies to predict new WMD threats.
- Continue to stimulate, identify, and execute high-impact projects to address long-term resolution of WMD issues.
- Continue to provide long-range analytical support to the warfighter.
- Continue to develop architectures and capabilities to reduce current and emerging threats.
- Continue to emphasize cross-cutting integration and alternative thinking and strategies

FY 2006 Plans

- Continue systems analysis studies to predict new WMD threats.
- Continue to stimulate, identify, and execute high-impact projects to address long-term resolution of WMD issues.
- Continue to provide long-range analytical support to the warfighter.
- Continue to develop architectures and capabilities to reduce current and emerging threats
- Continue to emphasize cross-cutting integration and alternative thinking and strategies

FY 2007 Plans

- Continue systems analysis studies to predict new WMD threats.
- Continue to stimulate, identify, and execute high-impact projects to address long-term resolution of WMD issues.
- Continue to provide long-range analytical support to the warfighter.
- Continue to develop architectures and capabilities to reduce current and emerging threats
- Continue to emphasize cross-cutting integration and alternative thinking and strategies

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Infrastructure	3.1	0	0	0

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

FY 2004 Accomplishments

- Civilian Salaries transferred to O&M.
- Funding provided for the Defense Threat Reduction Information Analysis Center (DTRIAC) continues the collection and preservation of the data and knowledge derived during more than 50 years of nuclear weapons effects testing and studies. In FY 2005, management and funding transferred within DTRA from RDTE,DW to O&M, to facilitate the availability and use of data archival, retrieval and analysis across the agency.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: N/A

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Modeling and Simulation Program	0	5.3	8.7	8.4

FY 2005 Plans:

- Deliver Integrated Theatre Engagement Model (ITEM) with an initial Weapons of Mass Destruction (WMD) Impact Capability.
- Deliver an Integrated Weapons of Mass Destruction Toolset (IWMDT) capability that provides planning and assessment capability for conventional and nuclear targeting along with WMD analysis for net centric warfare.
- Integrate IWMDT services into the Horizontal Fusion Portfolio as the Chemical, Biological, Radiological, Nuclear, High Explosive, (CBRNE) charter member providing shared integrated CBRNE data across the Global Information Grid (GiG) and the Shared Collateral Space.

FY 2006 Plans:

- Deliver Theatre Engagement Model (ITEM) with a complete Weapons of Mass Destruction (WMD) impact capability.
- Deliver initial Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance, (C4ISR) implementation across Integrated Weapons of Mass Destruction Toolset (IWMDT) enterprise architecture.
- Deliver initial Simulation integration capability across IWMDT enterprise architecture.
- Deliver initial Anti-Terrorism/Force Protection capability across IWMDT enterprise architecture.

FY2007 Plans:

- ITEM has fully integrated multi-user interface and remote access capability.
- Fully integrate C4ISR capability across IWMDT enterprise architecture.
- Fully integrate Simulation capability across IWMDT enterprise architecture through external application services-based functionality.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BD– Testing Technologies and Integration

- Fully integrate Anti-Terrorism/Force Protection capability across IWMDT enterprise architecture.
- Deliver initial unconventional assessment capability within IWMDT architecture.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers:

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
WMD Counterforce Applications	0	3.5	4.0	4.0

FY 2005 Plans:

- Initiate science and technology workshop with National Science Foundation for Agent Defeat (AD) technology development.
- Initiate chemical weapon Agent Defeat (AD) technology research.
- Continue development of innovative Agent Defeat payloads.

FY 2006 Plans:

- Continue development of innovative AD technologies and their weaponization.
- Initiate development of live agent tunnel test diagnostic technology.
- Initiate applied research program to implement National Science Foundation (NSF) R&D recommendation on Biological Weapons (BW) agent characterization.

FY2007 Plans:

- Begin development of augmented directed energy payload.
- Continue development of live agent tunnel test diagnostic technology.
- Continue BW agent characterization and defeat technology research.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: N/A

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BE– Testing Technologies and Integration

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project BE – Testing Technologies & Integration	14.1	13.4	24.7	22.6	22.4	22.9	22.8	22.0

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.
- The project develops, provides and maintains 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.
- This project 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).
- Specific programs supported by this project include:
 - Hard Target Defeat (HTD);
 - Anti-terrorism/Force Protection(AT/FP);
 - CP2 Counterforce Advanced Concept Technology Demonstration (ACTD);
 - Special Operations Forces (SOF).
- This project maintains testing infrastructure to support:
 - Warfighters;
 - Other government agencies;
 - Friendly foreign countries testing requirements on a cost reimbursable basis.
- This project also develops strategy and planning for a WMD test-bed infrastructure focusing on nuclear, biological, and chemical facilities, and the hard and deeply buried facilities in which these activities are often located.
- The project 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.
- Specific activities include:
 - Test-bed design and construction;
 - Instrumentation and data collection;
 - Test coordination and execution;
 - Post-test analysis and documentation.
- This project directly supports:
 - PE 0602717BR - Project BC;

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BE– Testing Technologies and Integration

- PE 0602716BR - Projects BD & BF;
- PE 0603160BR - Projects BJ & BK.

B. Accomplishments/Planned Program:

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Test and Technology Support	11.5	11.4	12.0	12.1

(Re-titled in FY 2005 from Test-Bed Operation and Support)

FY 2004 Accomplishments

- Provided unique testbed capabilities for weapon-target interaction and WMD programs. DTRA supported 134 tests for Counterproliferation (CP2) Advanced Concept & Technology Demonstrations (ACTD), Hard Target Defeat demonstrations, antiterrorism technology, general phenomenology and Service support.
- Provided an inventory of unique targets, infrastructure support, and expertise for conduct of major integrated test programs, including instrumentation maintenance, gage installation, data recording, source diagnosis, environmental support, safety support, experiment installation, experiment fielding, and test fielding.
- Initiated Program Environmental Impact Statement (PEIS) process to support DTRA in proposed expansion of testing and related activities at White Sands Missile Range (WSMR).
- Stood up new Infrastructure Support Office to standardize logistics, operations and support across test sites, including simulators, and integrate infrastructure development and improvement.
- Continued to keep the Large Blast/Thermal Simulator (LB/TS) in caretaker status, with limited testing of protective structures

FY 2005 Plans

- Continue to provide unique national test-bed capabilities for weapon-target interaction and Weapons of Mass Destruction (WMD) threat reduction programs. Continue to provide testing support.
- Provide an inventory of unique targets, infrastructure support, and expertise for conduct of major integrated test programs, including:
 - Instrumentation maintenance.
 - Gauge installation.
 - Data recording.
 - Source diagnosis.
 - Environmental support.
 - Safety support.
 - Experiment installation.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BE– Testing Technologies and Integration

- Experiment fielding.
- Test fielding.
- Support Program Environmental Impact Statement (PEIS) process to support DTRA in proposed expansion of testing and related activities at White Sands Missile Range.
- Integrate new Infrastructure Support Office to standardize logistics, operations and support across test sites, including simulators, and integrate infrastructure development and improvement.
- Continue to maintain the Large Blast and Thermal Simulator in caretaker status, with the ability to conduct curtain wall tests and blast tests on short notice

FY 2006 Plans

- Continue to provide unique national test-bed capabilities for weapon-target interaction and WMD threat reduction programs. Continue to provide testing support.
- Continue to maintain the Large Blast and Thermal Simulator in caretaker status, with the ability to conduct curtain wall tests and blast tests on short notice

FY 2007 Plans

- Continue to provide unique national test-bed capabilities for weapon-target interaction and Weapons of Mass Destruction (WMD) threat reduction programs. Continue to provide testing support.
- Continue to maintain the Large Blast and Thermal Simulator in caretaker status, with the ability to conduct curtain wall tests and blast tests on short notice.

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

PROJECT NAME AND NUMBER:

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

Project BE– Testing Technologies and Integration

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Infrastructure Development and Improvement	0	2.0	2.0	2.0

(Re-titled in FY 2005 from Field Support)

FY 2005 Plans

- Continue to provide infrastructure support for:
 - Maintenance of government vehicles.
 - Transportation of equipment.
 - Communication.
 - Utilities for facilities.
 - Rental of facilities.
 - Supplies.
 - Custodial service.
 - Procurement of equipment in support of test execution.
- Phase II Stallion Control Center Upgrade
- Chestnut Control Center

FY 2006 Plans

- Continue to provide infrastructure support for maintenance of government vehicles, transportation of equipment, communication, utilities for facilities, rental of facilities, supplies, custodial service and procurement of equipment in support of test execution.
- Testbed remediation
- Buildings to support testing at Permanent High Explosives Test Site (PHETS).

FY 2007 Plans

- Continue to provide infrastructure support for maintenance of government vehicles, transportation of equipment, communication, utilities for facilities, rental of facilities, supplies, custodial service and procurement of equipment in support of test execution.

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Environmental Restoration Support	2.6	0	10.7	8.5

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BE– Testing Technologies and Integration

FY 2004 Accomplishments

- Performed testbed cleanup and remediation as part of post-test activities at Nevada Test Site (NTS) locations.
- Performed testbed cleanup and remediation as part of post-test activities at the Chestnut Site, Kirtland Air Force Base, New Mexico.

FY 2006 Plans

- Provide needed Environmental Restoration support for Defense Threat Reduction Agency (DTRA) Nevada Test Site (NTS) locations in accordance with the Federal Facilities Agreement and Consent Order (FFACO) between the Nevada Division of Environmental Protection (NDEP), the National Nuclear Security Administration (NNSA), and the DTRA; and at other locations as needed.
- Conduct Environmental Site Assessment for DTRA locations on Kirtland Air Force Base, New Mexico.

FY 2007 Plans

- Continue to provide needed Environmental Restoration support for DTRA NTS locations in accordance with the FFACO between the NDEP, the NNSA, and the DTRA; and at other locations as needed.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: Acquisition of Environmental Restoration Support is normally through an Interagency Cost Reimbursable Order (IACRO) to the National Nuclear Security Administration Nevada Site Office (NNSA/NSO) and/or through Military Interdepartmental Purchase Requests (MIPRs) to the Air Force Center for Environmental Excellence (AFCEE) or the Naval Facilities Engineering Command (NAVFAC).

E. Major Performers: Approximately \$2.1M of FY 2004 funding was obligated with Applied Research Associates, Inc, located in New Mexico, and \$2.4M of FY 2004 funding was obligated with the Department of Energy/Nevada Operations. Funding was obligated in direct support of Project BE – Testing Technologies and Integration.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project BF – CP Operational Warfighter Support	44.2	91.2	94.2	98.1	100.4	103.8	107.5	110.0

A. Mission Description and Budget Item Justification:

The CP Operational Warfighter Support project provides the bridge between the WMD Defeat Technology base and operational and intelligence community needs. The overall project goal is to support the Joint Chiefs of Staff (JCS), the warfighting Combatant Commanders and Services/agencies engaged in countering WMD threats and to protect the U.S. and its allies against military or terrorist use of WMD. This project develops hard and deeply buried target defeat technology, provides targeting and Intelligence Community (IC) support, exercises WMD Defeat Technology and products with the users, develops DoD compliant simulations that exploit counterproliferation (CP) models for target planning and collateral effects prediction, and demonstrates WMD defeat capabilities in operationally realistic environments. The technical approach is to integrate technologies developed in other WMD defeat projects, to conduct a full spectrum of tests to verify capability enhancement, to expose customers to these capabilities in exercises, wargames and demonstrations, to integrate WMD defeat technologies into customer operations, and to support use of these capabilities during contingency operations. These three areas are: 1) Operational Support Technology, 2) Hard Target Defeat (HTD) Program and 3) Special Projects (previously accounted for in Hard Target Defeat Program).

- Operational Support Technology.** The Weapons of Mass Destruction Assessment and Analysis Center (WMDAAC) provides the warfighter with the capabilities and understanding for countering the use and effect of Weapons of Mass Destruction (WMD) through the advancement of simulation technology, assessment of operational impact, development of collaborative capabilities and access to mature computer models. Specifically: (1) WMDAAC develops advanced simulations from first-principles physics models produced in other projects in this program element (extensively Project BD). WMDAAC personnel provide an interface between DTRA model developers and the weapons effects simulation community to ensure maximum utility of DTRA models in distributed interactive simulations through compliance with C4ISR & High-Level Architecture (HLA) standards and protocols documented in Federation Object Models; (2) WMDAAC uses these advanced simulations to assist the warfighter in quantifiably assessing operational theater plans and post-attack warfighting effectiveness and to develop alternatives to mitigate the effects of WMD; (3) WMDAAC develops and adapts capabilities to project information through advanced visualization techniques and advanced collaboration at widely dispersed locations including Combat Commanders. Commercial and government-developed technologies are selected and proven in a research environment, and then transitioned to the DTRA Operations Center and/or other warfighter customers; and (4) WMDAAC provides warfighters and first responders with ready access to mature computer models, WMD databases and expert field assistance and training. The end result is to provide more realistic models and simulations of the effects of WMD for use in training, analysis, experimentation, operational environments and acquisition. In FY 2004, the WMDAAC will open the Weapons of Mass Effect (WME) Battle Laboratory. The WME Battle Lab is a natural “next step” in the evolution of WMDAAC’s simulation and collaboration technology development activities. These activities, combined with its operations research capability, will provide a resource which will enable the warfighter to better understand the effects of WME and refine concepts of operation and battle plans.
- Hard Target Defeat Program.** The United States and its allies face a growing threat related to critical military targets hidden within and shielded by hardened, deeply buried tunnel complexes. These complexes may house biological/chemical/nuclear weapons production or storage facilities; command,

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

control, and communications facilities; and/or theater ballistic missiles with their transporter-erector-launchers (TELs). An objective of this project is to examine the existing U.S. and Allied capabilities to hold hardened, deeply buried tunnel targets at risk. Deficiencies and technology gaps will be identified and the ability of planned systems to address them will be assessed. Finally, new technologies needed to mitigate remaining shortfalls will be evaluated as candidates. Promising concepts are selected for new hard target defeat technology development tasks. These tasks support warfighting requirements derived from the Hard and Deeply Buried Target Defeat capstone requirements document and research, development, test and evaluation (RDT&E) priorities set by the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD (AT&L)). Funds added for FY05 and beyond are a result of the Secretary of Defense strategic review for FY 2002 when this review found the baseline investments in this area as insufficient in FY05 and beyond to develop the technologies identified in the Hard and Deeply Buried Target Defeat (HDBTD) Science and Technology (S&T) Master Plan. Initiatives included in the S&T Master Plan included development of advanced energetics programs, development of concepts and technologies for tunnel defeat weapons, and increased level of effort in tunnel defeat testing to improve weapons effects modeling for penetration and weapon lethality. This area supports the Joint Functional Concept of Battlespace Awareness and Force Application and the Quadrennial Defense Review transformational Goal to Deny Enemy Sanctuary by developing and demonstrating technologies to strengthen joint and combined warfighting capabilities useful in the Global War on Terrorism (GWOT). Supported Transformational Sub-Goals within “deny enemies sanctuary” are small-diameter munitions and defeat of hard and deeply buried targets.

The following paragraphs describe the two major functional areas needed to develop target defeat capabilities and support warfighter operations: attack technologies, and tunnel defeat testing.

- Attack Technologies.** As input to the defeat assessment component of target defeat, physics-based models for all relevant weapons effects and weapon-target interactions are being developed. Specific technology areas being updated include warhead penetration into intact and damaged rock, tunnel collapse near the portal area, in-tunnel effects (including airblast, fragmentation, heat, and electromagnetic pulse), blast door response, and the fragility of critical and vulnerable equipment. The models will incorporate effects from weapons currently in the inventory as well as more advanced defeat concepts. Activities in the technology development area include first principle calculations, numerical simulations, laboratory testing, precision small-scale experiments, fast-running engineering model development, and full-scale field tests at several test ranges. The algorithms and methodology comprising the tunnel defeat models are being submitted for accreditation to the Joint Technical Coordinating Group for Munitions Effectiveness (JTTCG/ME). New more lethal defeat options for Hard and Deeply Buried Targets (HDBTs) like the massive ordnance penetrator, that can overwhelm target characterization uncertainties, are being developed and demonstrated to provide a 10x increase in weapon lethality and improved penetration capability compared to inventory weapons. In partnership with the Air Force, a weapon-borne battle damage information transmitter that attaches to Bomb Live Unit (BLU)-109 penetrators is being developed and demonstrated to provide impact location, penetration path, and fuze function information to the global information grid. This information is required to provide a needed capability to make a quick predictive assessment of the weapon effectiveness on the target based on the actual weapon delivery information. Additional activities include advanced energetic and non-energetic weapons. Thermobaric weapons are examples of advanced energetic weapons. Non-energetic weapons do not use blast as the defeat mechanism.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

- Tunnel Defeat Testing.** This testing acquires data to better understand weapons effects phenomenology and is used to develop models and attack options for defeating tunnels. The effectiveness of the improved end-to-end defeat capability for tunnels is being demonstrated in a series of three operational exercises being conducted at the Nevada Test Site (NTS). Each exercise will consist of tunnel defeat testing and analyses conducted in the context of an attack on a particular type of tunnel target complex. Phase 1 is associated with tunnel complexes housing theater ballistic missiles Tactical Ballistic Missiles (TBMs), their Transporter-erector launchers (TELs), and other support equipment. Phase 2 will represent Command, Control, Communications, and Intelligence (C3I) centers housed in tunnels. Phase 3 will be associated with Weapons of Mass Destruction (WMD) production and storage facilities. Each demonstration phase includes facility definition, tunnel construction and outfitting, simulated target system operations and related data collection, attack planning, test execution, battle damage assessment and repair and assessment of test results. All the tests are being conducted within the context of a realistic operational scenario involving the use of end-to-end defeat planning tools and procedures with current and advanced weapons, sensors, and platforms. These tests will demonstrate the effectiveness of each of these elements against realistic tunnel targets.

A supplemental tunnel defeat demonstration series at White Sands Missile Range (WSMR), referred to as “WSMR Portals,” is currently being planned to address important hard target defeat demonstration requirements that will not be met by the exercises at NTS. These requirements include realistic air operational tactics, stand-off weapons, geologies with granite rock, and the ability to apply stand-off air-to-ground weapons, artillery, Multiple Rocket Launch System (MRLS), and tactical missiles against tunnel facilities. In addition to being of great interest to the warfighters, meeting these requirements will create numerous test opportunities for emerging projects in advanced weapons, for example thermobaric weapon concepts.

- Special Projects.** The Special Projects effort is an outgrowth of the targeting and characterization work previously performed under the Hard Target Defeat Program. Accomplishments and funding for FY 2004 are shown under the Hard Target Defeat Program’s Attack Technologies. Starting with FY 2005, all funding and milestones will be shown under Special Projects. Many of our potential adversaries have invested considerable resources and effort in protecting their critical military infrastructure from attack by building concealed, hardened and deeply buried facilities. While complete physical destruction may be desired, for some hard and deeply buried targets this effect isn’t practicable with current weapons and employment techniques. It may be possible, however, to deny or disrupt the mission or function of a facility. Functional defeat is facilitated through better data collection and intelligence preparation against the potential targets. The defeat process includes finding and identifying a facility, characterizing its function and physical layout, determining its vulnerabilities to available weapons, planning an attack, applying force, assessing damage, and, if necessary, suppressing reconstitution efforts and re-striking the facility. Special Projects supports the Intelligence Community and the Combatant Commands by providing 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 technological applications 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. Special Projects consists of two subordinate and related activities, Targeting and Intelligence Community (T&IC) support and the new Find, Characterize, Assess (FCA) technology development activity.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

- Targeting and Intelligence Community (T&IC) Support.** This activity enables the functional or physical defeat of hard and deeply buried targets by developing and employing a variety of resources and techniques to find and precisely locate facilities and identifying critical features, functions, components and vulnerabilities. T&IC Support directly provides the Intelligence Community with the geological, structural and functional analysis necessary to effectively support the employment of current weapons and newly developed techniques for defeat of hard and deeply buried targets. This activity will also help achieve more efficient use of weapons and delivery platforms by providing difficult-to-obtain Combat Assessment of attacks on underground facilities. The T&IC activity provides the first critical step toward denying the enemy sanctuary in hard and deeply buried facilities. This approach directly results in accomplishment of our objective by providing timely and accurate target characterizations to the warfighters and Intelligence Community. Specific T&IC efforts include continued development of the Underground Targeting and Analysis System (UTAS) software suite used for characterization and modeling of hard and deeply buried targets and relocation and periodic upgrade of the Hard Target Research and Analysis Center (HTRAC) where this software is used by DTRA and supporting contractors to analyze and assess targets for the Intelligence Community.
- Find, Characterize, Assess (FCA) Technology Development.** The new Find, Characterize, Assess (FCA) activity serves as the technology base for the Target and Intelligence Community (T&IC) support activity by selecting, developing, testing and demonstrating promising technologies to help the warfighter and the Intelligence Community detect, locate, identify, characterize and assess hard and deeply buried targets. The FCA activity provides the technical means and methods required by the T&IC Support activity. Promising technology applications and hardware will be transitioned to the Services or the Intelligence Community for acquisition and integration. New processes and techniques developed through this effort will be transitioned directly into the Intelligence Community through our T&IC Support activity. The principal efforts to be executed under the FCA Technology Development activity include continued development and of geotechnical characterization data, tools and models; development of specialized sensors and data for post-attack assessment of targets; development and integration of new planning tools; and integration and improvement of related databases. Specific geotechnical efforts include delivery of area geology characterizations, development of site characterization methodologies and delivery of site-specific geology characterizations and development of methodologies for assessing post-attack effects. The goal of the Sensors and Signatures technology development effort is to develop a sensor and related signatures library to support pre-attack characterization and post-attack assessment of HDBT function and status. Analytical Tools development efforts will focus on development and integration of a sensor planning tool to facilitate the employment of sensors for the characterization of selected hard and deeply buried targets and development of a Human Intelligence (HUMINT) automated interview tool to improve the speed and accuracy of the HUMINT collection process for UGFs. Finally, database improvements will progressively integrate these new tools and databases together into a comprehensive family of systems. This activity will result in fielding of sensors, supporting tools, data, and processes, for locating, identifying and characterizing underground facilities. Successful execution of this activity will fill a recognized capability gap in support of Combatant Command and Intelligence Community Hard and Deeply Buried Target Defeat (HDBTD) Find, Characterize and Assess objectives.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

B. Accomplishments/Planned Program:

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Operational Support Technology	9.4	9.3	8.7	8.9

FY 2004 Accomplishments:

- Opened the Weapons of Mass Effect (WME) Battle Laboratory
- Demonstrated the utility of a WME Urban Dispersion Model for use and re-use in a collaborative 4-Dimensional (x, y, z, and time) simulation environment for integration into the Global Command & Control System for Combatant Commander application and use.
- Established network-centric capabilities for the Commercial Off-The-Shelf (COTS) Chemical Biological Response Aide (CoBRA), a tool for DoD and other federal agencies to deal with and report on WME incidents.
- Continued the education and training role through participation in selected Joint, Combatant Commands and service school exercises, experiments and wargames.
- Integrated high-fidelity physics-based models and simulations with international partners.
- Sustained collaborative and reachback capabilities to support DTRA’s role in satisfying emerging warfighter and homeland security requirements.
- Expanded our support of other federal agencies as directed in the war against terrorists as it pertains to Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) issues exploiting information technology with assured security.
- Supported the Homeland Security Command and Control Advanced Concept and Technology Demonstrations (ACTD) Demonstration.
- Maintained a Back-up/Alternate Reachback Center at Kirtland AFB, providing uninterrupted access to DTRA services and information databases, should the primary facilities in Alexandria, VA, become unusable for any reason.
- Established Coordination and Engineering Service Agreements with US Joint Forces Command (JFCOM) J7 Joint National Training Capability (JNTC) Joint Management Office (JMO), Joint C4ISR Battle Center (JBC- reports to J8), and J9 Joint Experimentation Directorate to provide CBRNE-focused modeling and simulation and subject matter expert support to Transformation and Joint Concept Development and Experimentation (JCDE) activities/events
- Developed and coordinated a multidirectorate Technology Development Directorate, Combat Support Directorate, Advanced Systems and Concepts Office, Implementation Plan to provide DTRA support to Joint Concept Development and Experimentation (JCDE).
- Initiated DTRA-wide experimentation concept plan.
- Developed the Technology Development Directorate Modeling & Simulation Plan.
- Continue to provide white-cell reachback support to the Unified Defense and Determined Promise annual exercises
- Continue participation in the Joint Forces Command exercise series, with focus on integrating coalition Weapons of Mass Effect (WME) expertise with DTRA modeling and simulation.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY	PROJECT NAME AND NUMBER:	
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

FY 2005 Plans

- Complete design and installation of information technology infrastructure for WME Battle Lab.
- Focus on integrating coalition WME expertise with DTRA modeling and simulation through continued participation in the Joint Forces Command experimentation series
- Continue to provide white-cell reachback support to the Unified Defense and Determined Promise annual exercises.
- Complete Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) Object Model version core set of data elements required by high-resolution weapons and collateral effects simulations.
- Establish initial operating capability for Weapons Analysis Lethality Toolset (WALTS) version 2. The tool will support force protection and consequence management exercises, real-world events, weapons effectiveness evaluations, and examination of foreign system vulnerabilities.
- Continue development, injection, and integration of advanced WME modeling and simulation capabilities into warfighter C4ISR architecture.
- Continue to build and strengthen DTRA’s role in the testing and use of networks and simulations required to support:
 - U.S. Joint Forces Command/Joint Concept Development and Experimentation (EAD)USJFCOM/J9’s Distributed Continuous Experimentation Environment (DCEE).
 - U.S. Joint Forces Command/Joint Training (EAD) USJFCOM/J7’s live, virtual, and constructive (LVC) component development.
- Integration/interoperability of DTRA LVC modeling and simulation (M&S) systems into the training environment.
- Provide a virtual DTRA presence at Joint Chiefs of Staff (JCS), USJFCOM, and Joint National Training Center exercises by remotely introducing WME events and projecting them onto a common operational picture Battlespace.
- Use M&S to formulate and test alternatives to mitigate the effects of WME.
- Deliver prototype Joint Operational Effects Federation demonstrating the combination of a hazard prediction model with a base operations simulation.
- Conduct Modeling and Simulation (M&S) verification and validation testing of Weapons of Mass Effect (WME) related software development and life-cycle maintenance activities.
- Conduct WME research and development (R&D) by prototyping, testing, evaluating, demonstrating, and distributing applied technology products and operational reachback capabilities in support of the Combatant Commands, Services, DoD agencies, and federal organizations in conducting incident assessment and management.
- As a Joint National Training Capability (JNTC) Joint Management Office (JMO) Development Partner, support research, design and technical development of Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) and Joint National Training Capability (JNTC) architectures, with the goal of certifying the DTRA WME Battle Lab for JNTC use.
- Participate in/support JNTC exercises and Joint Concept Development and Experimentation (JCDE) experiments/events/activities that would benefit most from increased consideration of CBRNE considerations, to include Joint Urban Operations and Multinational events.
- Integrate Integrated Weapons of Mass Destruction Toolset (WMDT) into selected JNTC exercises and JCDE experiments/events/activities to support Integrated Weapons of Mass Destruction Toolset (IWMDT) design, testing, and verification and validation.

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

PROJECT NAME AND NUMBER:

Project BF - CP Operational Warfighter Support

FY 2006 Plans

- Obtain JNTC training site certification for the WME Battle Lab.
- Expand DTRA Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE)-focused participation in Joint Forces Command/Commander JFCOM-led JCDE Joint Prototype and Joint Concept Development path efforts, including support to Effects Based Operations, Joint Interagency Coordination Group and Operational Net Assessment.
- Deliver initial Simulation integration capability across IWMDT enterprise architecture.
- Integrate Weapons Analysis Lethality Tool Set (WALTS) into service training ranges.
- Expand DTRA participation in the Joint Capabilities Integration and Development System (JCIDS)

FY 07 Plans:

- Fully integrate the WME Battlab with the JNTC training network, to include Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) engineering/technical advice and support, warfighting tools, military/net assessments, field demos and tests, and advanced concept validation.
- Continue expanding participation with JFCOM for JCDE, Distributed Continuous Experimentation Environment (DCEE), Joint (C4ISR) Battle Center, (JBC), and JCIDS prototypes, to include a full spectrum of modeling & simulation modules for Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) (using IWMDT), to include supporting the Chemical Biological Defense Program (CBDP).
- Expand support to the U.S. strategic deterrent, mission assurance/ Force Protection, consequence management, and homeland defense.
- Begin integration planning for transition to the Global Information Grid (GIG).

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Hard Target Defeat Program	21.4	67.2	67.1	68.8

FY 2004 Accomplishments

- Formulated and tested new explosive mixtures in penetrating warheads optimized for use against tunnels and chemical and biological targets.
- Completed lab-scale tests and developed delivery concepts for weapons with non-energetic warhead fills
- Investigated fundamental properties of thermobarics
- Continued development of high fidelity computational fluid dynamics models for thermobarics performance and lethality
- Developed improved reactive materials for higher lethality
- Identified mission critical equipment and vulnerabilities for WMD production tunnel facilities.
- Initiated a feasibility study for a boosted penetrator that will penetrate at least 50% more than current weapons.
- Continue development of defeat technologies to model and predict the extent of multiple weapons penetration, tunnel damage, and advanced weapon performance.

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

PROJECT NAME AND NUMBER:

Project BF - CP Operational Warfighter Support

- Continued development of high-payoff novel explosive concepts using advanced energetic material to enable defeat of targets currently invulnerable to weapons solutions.
- Completed Deep Digger laboratory technology verification experiments, and conduct preliminary design review for prototype design and transfer the technology to the Army.
- Continued development of system fragility and response models for Command, Control, Communications and Intelligence (C3I) equipment.
- Developed tunnel aim point optimization models to increase the effectiveness of the planning tools developed for warfighter planners.
- Continued assessments of hostile facilities based on JCS and Combatant Commanders priorities. Details are classified.
- Develop improved weapon/target interaction models of tunnels and liners to nuclear ground shock environments. Incorporated these models in the MEA planning tool.
- Released MEA 5.0.
- Planned a massive ordnance airblast lethality test.
- Initiated the massive ordnance penetration technology demonstration.
- Supported HDBT defeat planning with Targeting/Weaponing Assistance Cell.
- Successfully completed first 12-month effort within Phase I for Non-Energetic Advanced Payload Fills program.
- Developed an 84mm Multi-Target Shoulder Launched penetrating round for SOCOM.
- Developed and validated remote site geologic characterization technology.
- Incorporated initial nuclear and conventional weapons effects analysis and initial network analysis into the UTAS software.
- Support targeting and IC by conducting assessments of hostile facilities based on JCS and Combatant Commanders priorities.
- Completed six geotechnical templates for hard and deeply buried target characterization.
- Characterized targets and developed additional three-dimensional target models for delivery to Combatant Commands and the IC.
- Documented lessons learned from Red-Blue-White exercise.
- Initiated WMD material assessment concept demonstration.
- Analyzed Operation Iraqi Freedom Bomb Damage Assessment (BDA) data for ground truth comparison to characterizations and assessments delivered during operations.
- Developed final slope model for geologic template methodology.
- Compiled results from 8-Site Geotechnical Validation Study.
- Improved streamlined procedures for characterization of deep geology.
- Initiated concept development for find, characterize and assess technologies and planning tools.
- Initiated development of the Sensor Deployment Planning Tool.
- Continued research on the use of Conventional Explosive Radio Frequency (CERF) as a potential means to conduct Bomb Damage Assessment (BDA).
- Initiated DTRA support of the National Signatures Program.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

- Completed construction of tunnel portals and tunnel at the White Sands Missile Range.
- Using newly developed tactics, techniques, and procedures (TTPs), conducted DIVINE WARHAWK operational tunnel defeat demonstrations against tunnel portals using inventory and new standoff weapons at the White Sands Missile Range.
- Developed a conceptual design of the Improved 500 lb (I-500) penetrator to defeat HTBTs.
- Planned a demonstration of massive ordnance bomb against a tunnel facility at the White Sands Missile Range.
- Conducted functional defeat operational demonstrations on the Command, Control, Communications and Intelligence (C3I) tunnel complex to be constructed at the Nevada Test Site.
- Conducted MIDWAY EMERALD tests of joint Advanced Tactical Munitions System-Penetrator (ATACMS-P) weapon against a target at White Sands Missile Range in support of ATACMS-P Advanced Concept Technology Demonstration (ACTD).
- Conducted demonstrations and evaluations of sensor technologies to improve bomb damage assessment (BDA) of functional attacks on tunnel facilities
- Completed signature data collection of long operational tunnel facility complex at White Sands Missile Range.
- Selected and implemented enhanced CBR protection technologies into an existing building in Maryland for Project Ancile
- Performed weapons effects assessment for current and concept weapons for OSD Acquisition Technology and Logistics (AT&L) to support the Strategic Capabilities Assessment.
- Supported OSD (AT&L) by drafting the 2004 Hard and Deeply Buried Target Defeat Report to Congress
- Conducted joint test and evaluation of lethality of high speed penetrator warhead against a DTRA test bed (Tactical Missile System Penetrator (TACMS-P).

FY 2005 Plans

- Continue development of optimized explosive formulations; down-select most promising formulations for more extensive testing.
- Conduct methodology down-select and complete Phase I report of non-energetic fill concepts.
- Collect experimental data on new model of thermobaric explosive (TBX) formulations and refine TBX metrics.
- Enhance model of coupled combustion and flow in TB detonations.
- Identify TBX weapon concepts for use against hard and deeply buried targets.
- Continue investigation of Aluminum combustion mechanisms; apply to (TBX) formulation improvement.
- Develop formulation design techniques for improved energy coupling to targets.
- Develop improved explosive formulations based on use of coated micron- and/or nano-particles.
- Begin development of reactive structural materials suitable for use in penetrating warheads or against chem./bio or surface targets.
- Conduct multiple Proof of Principle field tests for Non-Energetic Advanced Payload Fills.
- Down select best 1 or 2 performing non-energetic fills for use in conventional Bomb Live Unit (BLU)-109 and Mark (MK)-84 munitions.

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

PROJECT NAME AND NUMBER:

Project BF - CP Operational Warfighter Support

- Conduct weapon qualification testing for the 84mm Multi-Target Shoulder Launched round for Special Operations Command (U.S) SOCOM to include multiple fill analysis.
- Assess data from field impact tests of projectiles with unstable trajectory.
- Develop weapon system survivability model for horizontal (skip bomb) delivery.
- Develop algorithm for weapon trajectory stability in horizontal (skip bomb) delivery.
- Analyze High Velocity (HV) penetration lab data evaluating oblique impacts of novel case shapes.
- Analyze effectiveness of massive penetration against hard and deeply buried targets and complete preliminary design.
- Initiate hypervelocity penetration lethality demonstration.
- Complete the feasibility study of the boosted penetrator.
- Develop portal extension engineering response model.
- Update tunnel portal closure model for smaller diameter (vent-size) openings.
- Integrate fragment model with 1.5D (Dimension) airblast model for Munitions Effects Assessment (MEA) 6.0.
- Assess experimental data for development & validation of vent-related airblast models.
- Develop methodology to assess equipment fragility based on generic characterization.
- Develop equipment fragility model for Munitions Effects Assessment (MEA) 6.0.
- Obtain Joint Technical Coordinating Group (JTTCG)-accreditation of High Performance Computing and Integrated Munitions Effects Assessment (HPC + IMEA) equipment fragility model for Command, Control, Communications and Intelligence (C3I) type tunnel.
- Improve blast door model and release Munitions Effects Assessment (MEA) 6.0.
- Design prototype submunition and sensor to disrupt tunnel operations.
- Accelerate development of high-payoff novel explosive concepts using advanced energetic materials to enable defeat of targets currently invulnerable to weapons solutions.
- Update nuclear planning tool Munitions Effects Assessment (MEA)-Nuclear.
- Execute two intermediate scale tests to develop and validate high performance computer (HPC) models of tunnel facilities to sever ground shock loading. Begin the design of a full-scale test to validate the HPC models.
- Support COCOM HDBT defeat planning with the Targeting/Weaponing Assistance Cell.
- Provide 100 detailed hard target defeat weaponing recommendations to warfighters
- Provide 6 hard target defeat training sessions to warfighters.
- Conduct DIVINE WARHAWK deep underground operational tunnel facility defeat demonstrations using advanced weapons at the White Sands Missile Range.
- Conduct DIVINE HELCAT reconstitution exercise and determine reconstitution time for C3I tunnel facility at Nevada Test Site (NTS).
- Complete design of simulated WMD production and storage tunnel complex.
- Begin planning for DIVINE HATES WMD production and storage tunnel complex functional defeat.

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

PROJECT NAME AND NUMBER:

Project BF - CP Operational Warfighter Support

- Begin planning for near-term integrated functional defeat demonstrations against multiple tunnel complexes.
- Execute static lethality tests of the I-500 weapon concepts against tunnel targets. Begin detailed system design.
- Conduct joint test and evaluation of lethality of high-speed penetrator warhead against a DTRA test bed (Tactical Missile System - Penetrator (TACMS-P)).
- Conduct joint test and evaluation of lethality of an Advanced Tactical Munition System (ATACMS) with a Stand-off Land Attack Missile (SLAM) warhead against a reinforced concrete frame structure test bed.
- Conduct small-scale multistory building tests and model development.
- Develop and validate coupled weapon penetration and deformation model.
- Develop weapon penetration model for damaged materials.
- Refine Massive Ordnance Penetrator (MOP) concept and begin detailed weapon development and testing
- Conduct Enhanced Fuze Integrated BDI Demonstration (EFIBDID) system design and tests.
- Develop coupled Tunnel AirBlast (TAB) model, validate it, and integrate with Munitions Effects Assessment (MEA).
- Conduct tunnel target defeat demonstrations with US Navy assets and weapons.
- Perform weapons effects assessment for current and concept weapons for OSD Acquisition Technology and Logistics (AT&L) to support the Hard and Deeply Buried Target Defeat HDBTD weapon acquisition.
- Support OSD (AT&L) by drafting the 2005 Hard and Deeply Buried Target Defeat Report to Congress
- Conduct statically emplaced Proof-of Principle test of effectiveness of Massive Ordnance Penetrator payload.
- Conduct demonstration of massive ordnance lethality against a full-scale tunnel target.

FY 2006 Plans

- Synthesize and scale-up nitrogen fluoride (NF₂) compounds.
- Apply coated micron- or nano-particles to weapon payloads.
- Begin to demonstrate most promising TBX in large-scale tests (hard and deeply buried target, tunnel, or responding structure).
- Begin development of general purpose Enhanced Blast Explosives (EBX) to improve next-generation TBX performance and expand its potential for use against an expanded target set.
- Continue development of reactive structural materials (RSM); begin development of techniques for weapon system integration of RSM.
- Begin concept demonstration and effectiveness tests for high-payoff energetic concepts
- Downselect to most promising chemical/biological agent defeat technologies based on mid-scale testing and begin scale-up of promising candidate materials/technologies.
- Develop and test at least two advanced formulations of high-energy survivable penetrator fills (Mach 1 to 4 impact velocities).
- Begin sub-scale demonstration tests with most promising reactive structural materials.
- Conduct 1/3 scale testing of down-selected Non-Energetic Advanced Payload Fills

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

PROJECT NAME AND NUMBER:

Project BF - CP Operational Warfighter Support

- Develop model and perform calculations for non-energetic payloads.
- Downselect novel Kinetic Energy (KE) gun propellant formulation.
- Perform static tests of advanced payload concepts to quantify effects and target lethality and analyze results.
- Evaluate results of advanced energetic and non-energetic payload development tests and analyses.
- Conduct static lethality demonstration of massive ordnance penetrator against hard and deeply buried targets
- Complete development of the prototype egress denial system concept, and produce and deliver test assets for advanced technology demonstration.
- Deliver Munitions Effects Assessment Version 7.0
- Verify shock harness of weapon-borne Battle Damage Indicator component.
- Support Component Command (COCOM) Hard and Deeply Buried Target (HDBT) defeat planning with Targeting/Weaponing Assistance Cell
- Complete construction and outfitting of Facility 3, WMD production/storage tunnel facility.
- Conduct operations at Facility 3 for sensor data collections.
- Initiate WMD operational defeat demonstrations using the Facility 3 testbed.
- Complete testing and demonstrations at the egress denial testbed.
- Initiate construction of the integrated demonstration test bed for mid-term technology.
- Initiate planning, siting, and design of a tunnel test bed to support the development, testing, and evaluation of S&T weapons concepts employing mid- to long-term advanced payload technology for defeat of internal critical elements.
- Conduct large-scale multistory building testing and model Verification & Validation (V&V) efforts.
- Conduct Massive Ordnance Penetrator scaled penetration and lethality testing
- Demonstrate components of key BDI technologies for Enhanced Fuze Integrated BDI Demonstration (EFIBDID)
- Complete detailed system design of the I-500. Perform system level and flight tests.
- Provide 100 target weaponing recommendations to Targeting/Weaponing Assistance Cell (TWAC).
- Provide 6 hard target defeat training sessions to warfighters.

FY 2007 Plans

- Deliver and validate equipment fragility and other defeat models for weapons of mass destruction (WMD) tunnel facilities.
- Complete the development of a reconstitution model of WMD facility.
- Evaluate tunnel damage and in-tunnel effects of advanced weapon fills.
- Demonstrate weapon sensors to facilitate bomb damage assessment (BDA) analysis.
- Complete system fragility evaluation of WMD equipment.
- Investigate new weapon technology concepts to support start of hard deeply buried target defeat (HDBTD) advanced concept technology

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

PROJECT NAME AND NUMBER:

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

Project BF - CP Operational Warfighter Support

demonstration (ACTD) in FY08.

- Analyze results of egress denial demonstrations.
- Conduct Massive Ordnance Penetrator Demonstration.
- Continue development of general purpose EBX, compare effectiveness in expanded target set conditions vs. conventional High Explosives (HE) and latest TBX.
- Demonstrate most promising reactive structural materials in large-scale tests and begin technology transition.
- Demonstrate most promising high-payoff novel energetics concepts in sub-scale tests and begin warhead integration concept development.
- Demonstrate promising high-energy survivable penetrator fills in large-scale tests (tunnel or hardened structure) and begin technology transition.
- Demonstrate most promising chemical/biological agent defeat technologies in large-scale tests and begin technology transition.
- Demonstrate novel energetic material with tuned energy release (40% increase in Kinetic Energy (KE), 40% vulnerability reduction).
- Determine effectiveness of additional advanced weapon concepts and incorporate results into and release Munitions Effects/Effectiveness Assessment (HPC +IMEA) Munitions Effects Assessment (MEA) 8.0.
- Demonstrate most promising non-energetic advanced payload fills in large-scale testing.
- Begin transition of technology into smaller dynamic applications which support defeat of hardened facilities.
- Demonstrate most promising non-energetic advanced payload fills in biological defeat applications.
- Continue defeat demonstration testing at WMD tunnel facility.
- Continue evaluations of other/additional weapon/sensor systems.
- Complete construction of the integrated demonstration testbed and initiate the find and characterize phases of the demonstration.
- Initiate construction of the internal tunnel defeat testbed.
- Conduct full-scale Massive Ordnance Penetrator (MOP) performance demonstration against realistic hard and deeply buried targets
- Conduct full scale Enhanced Fuze Integrated BDI Demonstration EFIBDID demonstrations.
- Provide 100 target weaponeering recommendations to Targeting/Weaponeering Assistance Cell (TWAC).
- Provide 6 hard target defeat training sessions to warfighters.
- Support OSD (AT&L) by drafting the 2006 Hard and Deeply Buried Target Defeat Report to Congress.
- Conduct first large scale testing of weapons against bunkers under multi-story buildings.

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Special Projects	13.4	14.7	18.4	20.4

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

FY 2004 Accomplishments

FY 2004 accomplishments captured under Hard Target Defeat Program.

FY 2005 Plans

- Continue and enhance engineering characterization of targets and develop improved three-dimensional target models for delivery to Combatant Commands and the IC.
- Enhance Underground Targeting and Analysis System (UTAS) network-wide functional defeat and special operations planning and target visualization functionality.
- Conduct an Underground Vulnerability Assessment (Red-Blue-White) exercise.
- Offer four basic and one advanced Underground Facility (UGF) schoolhouse
- Improve and expand geotechnical assessment capabilities including a site specific geology database.
- Initiate collection of signatures and other data associated with DTRA hard target defeat testing and demonstrations.
- Continue development and demonstration of a Sensor Deployment Planning Tool.
- Develop Construction Technology Assessment (CTA) data interface for the Underground Targeting and Analysis System (UTAS).
- Continue research on Conventional Explosives Radio Frequency (CERF) as a potential contribution to Bomb Damage Assessment (BDA).
- Continue DTRA support to the National Signatures Program (NSP).
- Initiate Systems Engineering and Integration work on potential Find, Characterize, Assess (FCA) technologies.
- Initiate study of most likely candidates for tactical ground sensors.

FY 2006 Plans

- Continue to enhance engineering characterization of targets and develop improved three-dimensional target models for delivery to Combatant Commands and the intelligence community (IC).
- Implement UTAS architectural enhancements, computation improvements and Information Operations (IO) planning initial operational capability.
- Conduct an additional Underground Vulnerability Assessment (Red-Blue-White) exercise.
- Offer one advanced and four basic Underground Facility (UGF) schoolhouse.
- Begin development of tactical ground sensor for underground facility (UGF) characterization and combat assessment.
- Continue remote collection of signatures and other data associated with DTRA hard target defeat testing and demonstrations.
- Continue development and demonstration of a Sensor Planning Tool.
- Continue improvements to geotechnical assessment capabilities.
- Continue DTRA support to the National Signatures Program (NSP).
- Continue Systems Engineering and Integration work on potential FCA technologies.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BF - CP Operational Warfighter Support

- Expand the Construction Technology Assessment (CTA) database.
- Initiate development of a UGF specific, lap-top based human intelligence (HUMINT) Interview Tool.

FY 2007 Plans

- Continue to enhance engineering characterization of targets and develop improved three-dimensional target models for delivery to Combatant Commands and the intelligence community (IC).
- Implement UTAS architectural enhancements, computation improvements and Information Operations (IO) planning initial operational capability.
- Conduct an additional Underground Vulnerability Assessment (Red-Blue-White) exercise.
- Offer one advanced and four basic Underground Facility (UGF) schoolhouse.
- Begin development of tactical ground sensor for underground facility (UGF) characterization and combat assessment.
- Continue remote collection of signatures and other data associated with DTRA hard target defeat testing and demonstrations.
- Continue development and demonstration of a Sensor Planning Tool.
- Continue improvements to geotechnical assessment capabilities.
- Continue DTRA support to the National Signatures Program (NSP).
- Pursue operational transition of the prototype Sensor Deployment Tool.
- Continue Systems Engineering and Integration work on potential Find, Characterize, Assess (FCA) technologies.
- Expand the Construction Technology Assessment (CTA) database.
- Initiate development of a UGF specific, lap-top based human intelligence (HUMINT) Interview Tool.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: N/A

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BG - Nuclear Operations

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project BG Nuclear Operations	61.4	73.4	11.7	17.8	18.4	18.5	20.6	22.4

A. Mission Description and Budget Item Justification:

- This program directly reflects the National Military Strategy, the dictates of the Nuclear Posture Review (NPR), the Quadrennial Defense Review (QDR) and is directed by the JCS in the Joint Strategic Capabilities Plan (JSCP) Nuclear Annex while laying a foundation for potential transformation activities within the Nuclear arena as identified in DoD's Transformation Planning Guidance (TPG).
- This project encompasses WMD (Nuclear) Protection and Response.
 - Responsive to the oversight of the Nuclear Weapons Council, the project provides critical support to the Combatant Commanders, Services, JCS and OSD.
 - This project continues and improves upon the realignment begun by DTRA at its inception to deal with the emerging 21st Century strategic landscape.
 - This activity is in direct support to the National Military Strategy and other national and DoD level documents. These programs will:
 - Promote initiatives to detect, and attribute the surreptitious introduction and use of weapons of mass destruction (WMD) against the U.S. and its allies thereby protecting our citizens and critical infrastructures;
 - Dissuade potential adversaries, whether nations, terrorist groups or criminal organizations, from using asymmetric means of war such as WMD to counter U.S. conventional weapon superiority;
 - Enhance deterrence and proactively support the agency's mission of WMD threat reduction.

B. Accomplishments/Planned Program:

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
WMD (Nuclear) Protection and Response	14.7	6.1	11.7	17.8

FY 2004 Accomplishments

- Developed a deployable forensics lab; installed classified interagency communications system/communications terminals at critical agencies; performed the first-ever simulated nuclear event field exercise; formally integrated program plans and improved technical/operational procedures at the national level through support to DTRA's FBI customer, co-chair of the National Security Council (NSC) formed sub-Policy Coordination Committee Attribution Working Group; briefed the program to the Vice President in Nov 2003.
- Upgraded Sentry forensics database project.
- Expanded the SENTRY/SNIPER database.
- Continued analytical software. Demonstrated software feasibility for spectral analysis.

Exhibit R-2a, RDT&E Project Justification

Date: February 2005

APPROPRIATION/BUDGET ACTIVITY

RDT&E, Defense-Wide/Applied Research - BA2

0602716BR

PROJECT NAME AND NUMBER:

Project BG - Nuclear Operations

- Fielded the Multiplatform System (MPS) to the Technical Support Groups (TSGs). The MPS was used successfully during OPERATION IRAQI FREEDOM (OIF).
- Continued modernization program of mobile and hand held radiation detection units in the Pacific and European Commands.
- Continued development and fielding of passive and active Special Nuclear Material (SNM) detection systems capable of detection in cases where SNM is shielded; current detector technologies do not perform well when SNM is shielded for gamma and/or neutron emissions.
- Continued to produce through development and adaptive engineering detection equipment capable of rapid and standoff detection of radioactive materials across a broad spectrum of operational environments. Continued to develop equipment that is lighter, more rugged, environmentally stable, easy to operate and maintain with a longer battery life that can detect radioactivity and/or associated signatures.
- Conducted two radiation detection workshops to solicit new technologies/capabilities from the scientific/technical community that can be exploited to defeat the nuclear/radiological threat.
- Continued to integrate through new concept design or adaptive engineering multiple detection sensor systems to facilitate standoff operator detection of radioactive material and passive or active trigger, alarm, destruct, or detection devices targeting the operator.
- Enhanced the establishment of an administrative support structure for technical reporting and document production of R&D development efforts to permit publication at classified and unclassified levels and exploration of existing technologies to eliminate duplicating or redundant efforts, and exploit dual or multiple-use technologies.
- Continued to conduct operational analysis of commercial, vendor, "off-the-shelf", laboratory-produced concept design, or theoretical radiation detection devices in order to determine relative efficiencies, capabilities, and technologies to further enhance the ability to develop, procure, and employ reliable and current technologies for radioactive material detection.
- Rapidly developed and deployed an underwater array in support of Air Force Executive Office (AF/XOS) to meet very specific mission requirements.

FY 2005 Plans

- Complete development of the threat device models for Initial Operational Capability (IOC); complete development of integrated materials and debris database; assist NSC in developing and implementing a National Nuclear and Radiological Attribution Program Strategic Plan; perform debris analysis, evaluation and reporting exercises; complete development of ground sampling robots for IOC.
- Continue populating SENTRY and SNIPER databases. Start data correlation analysis.
- Continue the development of a ruggedized backpack detector. Perform initial operational test and evaluation.
- Continue the evaluation of lanthanum halides radiation detectors.
- Continue to improve Sentry forensics database project based on previous results and new technology.
- Complete development in the "Domestic Nuclear Event Attribution (DNEA) Program of the threat device models for Initial Operational Capability; complete development of integrated materials database; perform a networked attribution community exercise. Continue the development of operational concept for new equipment/systems.
- Upgrade support to Combatant Commanders Technical Support Groups (TSG) with an eye toward transformational opportunities.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY	PROJECT NAME AND NUMBER:	
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BG - Nuclear Operations

- Expand the development of passive and active Special Nuclear Material (SNM) detection systems capable of detection of associated signatures in cases where SNM is shielded.
- Expand the development of adaptive engineering for radiation detection equipment capable of rapid and standoff detection of radioactive materials to address the Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) threat.
- Conduct the development of a hand held chemical and biological sensor detector and conduct Initial Operational Test and Evaluation for use by Special Operations Forces (SOF).
- Begin development of technology to enhance operator abilities in the defeat of High Explosives (HE), Chemical and Biological improvised devices.
- Enhance further operational analysis of commercial, vendor, "off-the-shelf", laboratory-produced concept design, or theoretical radiation detection devices in order to determine relative efficiencies, capabilities, and technologies to further enhance the ability to develop, procure, and employ reliable and current technologies for radioactive material detection. Begin search for further revolutionary solutions.

FY 2006 Plans

- Perform an end-to-end integrated attribution community exercise; develop a program validation package for achievement of Initial Operational Capability in FY 2006. Continue development of improvements to lab radiochemistry processes, sample collection techniques, threat device modeling and evaluation, and community-wide database for progress towards Full Operational Capability (FOC) in FY 2009
- Continue to improve Sentry forensics database project based on previous results and new technology.
- Continue the population of SENTRY/SNIPER databases.
- Continue to explore technologies that can improve and/or enhance rapid deployable radiation detection and tracking system.
- Upgrade support to Combatant Commanders Technical Support Groups (TSG) to encompass the full spectrum of Chemical, Biological, Radiological, Nuclear, High Explosive threats.
- Enhance the development and fielding of passive and active detection systems capable of detection in cases where Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) materials are shielded. Improve effort by funding scientific review panel and technical support to review studies and proposals to determine promising track for transformational opportunities detailed research.
- Continue the development of operational concepts for new equipment/systems.
- Improve and upgrade integration through new concept design or adaptive engineering multiple detection sensor systems to facilitate standoff operator detection of material and passive or active trigger, alarm, destruct, or detection devices targeting the detection devices in order to determine relative efficiencies, capabilities, and technologies to further enhance the ability to develop, procure and employ reliable and current technologies for radioactive material detection. Continue search for further revolutionary solutions.

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY	PROJECT NAME AND NUMBER:	
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BG - Nuclear Operations

FY 2007 Plans

- Perform first flight test of Unmanned Aerial/Air/Aerospace Vehicle (UAV) air sampling system; continue development of improvements to lab radiochemistry processes, sample collection techniques, threat device modeling and evaluation, and community-wide database for progress towards Full Operational Capability (FOC) in FY 2009.
- Continue to improve Sentry forensics database project based on previous results and new technology.
- Continue the population of SENTRY/SNIPER databases.
- Continue to improve and enhance the development of a rapidly deployable-Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE)-detection and tracking system, integration of detection arrays with satellite communication and analytical software, expansion of multi-platform system prototype, and software development toward future deployment of attended or unattended variants, including mobile, maritime, aerial, and stationary or portal.
- Upgrade support to Combatant Commanders Technical Support Groups (TSG) to encompass the full spectrum of Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) threats.
- Continue the development of operational concepts for new equipment/systems.
- Enhance the development and fielding of passive and active CBRNE detection. Enhance the development of adaptive engineering detection equipment capable of rapid and standoff detection of CBRNE materials across a broad spectrum of operational environments. Develop equipment that without significant degradation is waterproof, shockproof, and resistant to extreme conditions and sustained employment. Develop lighter weight and smaller detector systems for more diverse field employment.
- Improve and upgrade integration through new concept design or adaptive engineering multiple detection sensor systems to facilitate standoff operator detection of CBRNE material and passive or active trigger, alarm, destruct, or detection devices targeting the operator.
- Enhance further operational analysis of commercial, vendor, "off-the-shelf", laboratory-produced concept design, or theoretical radiation detection devices in order to determine relative efficiencies, capabilities, and technologies to further enhance the ability to develop, procure, and employ reliable and current technologies for radioactive material detection. Continue search for further revolutionary solutions.

Cost (\$ in millions)	FY 2004	FY 2005	FY 2006	FY 2007
Classified Program	46.7	67.3*	0	0

(* FY 2005 includes \$60 million in No Year Funding)

FY 2004 Accomplishments

Classified

FY 2005 Plans

Classified

Exhibit R-2a, RDT&E Project Justification		Date: February 2005
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER:
RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	Project BG - Nuclear Operations

FY 2006 Plans
Classified

FY 2007 Plans
Classified

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: Approximately \$43.7M of FY 2004 funding was obligated with the Department of Energy/Albuquerque Operations Office in direct support of Project BG – Nuclear Operations.