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Exhibit R-1, RDT&E Programs

Defense Threat Reduction Agency

Date: February 2006

| R-1 Line Item No | Program Element Number | Item | Budget Activity | <u>TOA, \$ in Millions</u> | | | | | | |
|---------------------|------------------------------|--------------------------------------|--------------------|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | | | FY 2005 Cost | FY 2006 Cost | FY 2007 Cost | FY 2008 Cost | FY 2009 Cost | FY 2010 Cost | FY 2011 Cost |
| 1 | 0601000BR | DTRA Basic Research Initiative | 1 | 0.000 | 0.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 |
| 17 | 0602716BR | WMD Defeat Technology | 2 | 244.729 | 205.370 | 213.152 | 216.594 | 221.359 | 229.079 | 235.379 |
| 19 | 0602717BR | WMD Defense Technologies | 2 | 112.436 | 108.929 | 105.021 | 108.658 | 113.493 | 113.116 | 115.084 |
| 26 | 0603160BR | Proliferation, Prevention and Defeat | 3 | 89.839 | 107.879 | 104.582 | 109.371 | 109.906 | 111.593 | 113.503 |
| 121 | 0605110BR | Critical Technology Support | 6 | 1.919 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 134 | 0605502BR | Small Business Innovative Research | 6 | 6.143 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | Total RDT&E | | 455.066 | 422.178 | 427.755 | 439.623 | 449.758 | 458.788 | 468.966 |

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Basic Research – BA1 | R-1 ITEM NOMENCLATURE: DTRA Basic Research Initiative; 0601000BR | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Total 0601000BR Cost | 0.000 | 0.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 |
| BT - Basic Research for WMD Knowledge Gaps | 0.000 | 0.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 |

A. Mission Description and Budget Item Justification:

This program element funds broad-based scientific and technology basic research in technologies critical to mitigating current, emergent, and future WMD threats. Key thrust areas for this research will be in physics, materials, structures, biology, chemistry, and detection technology. This investment will seek to leverage the \$1B annual DoD investment in technology and apply this to the WMD Defeat and Defense challenges.

These efforts are closely coordinated with the chem-bio technology portfolio which executes a basic research program under the joint Chem-Bio Defense Program. Agency research interests are coordinated with those of DARPA and Service basic research programs through the Defense Basic Research Advisory Group. DTRA will review its research interests at least annually to focus on those technology areas not clearly addressed by other basic research efforts.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Basic Research – BA1 | | R-1 ITEM NOMENCLATURE: DTRA Basic Research Initiative; 0601000BR |

B. Program Change Summary:

| (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---|--------------|--------------|--------------|
| Previous President's Budget | 0.000 | 0.000 | 0.000 |
| Current President's Budget | 0.000 | 0.000 | 5.000 |
| Total Adjustment | 0.000 | 0.000 | 5.000 |
| Congressional program reductions | | | |
| Congressional reductions | | | |
| Congressional increases | | | |
| Reprogramming | 0.000 | 0.000 | 5.000 |
| SBIR/STTR Transfer | | | |
| Other program adjustments | | | |

Change Summary Explanation:

- This project is initiated by an internal transfer of funding within DTRA research and development resources to create a Basic Research program to support areas that are critical to defeating the emerging WMD threat.

C. Other Program Funding Summary: See Exhibit R-2a.**D. Acquisition Strategy:** Not Applicable.

E. Performance Metrics: Research performance is monitored through annual peer review of merit and measures of publications, significant awards, and transition efforts. Research relevance is monitored through assessment by the operational and applied research communities likely to benefit from basic research efforts.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Basic Research – BA1 | | PROJECT NAME AND NUMBER: 0601000BR Project BT – Basic Research for WMD Knowledge Gaps |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|--|---------|---------|---------|---------|---------|---------|---------|
| Project BT-Basic Research for WMD Knowledge Gaps | 0.000 | 0.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 |

A. Mission Description and Budget Item Justification:

Program provides for the discovery and development of fundamental knowledge and understanding by research performers drawn primarily from academia and world-class research institutions in government and industry. This leverages DoD's \$1 billion annual investment in basic research by ensuring a motivation within the scientific community to conduct research benefiting WMD-related defense missions and by improving agency knowledge of other research efforts of potential benefit to DTRA's non-proliferation, counterproliferation and consequence management efforts.

These efforts are closely coordinated with the chem-bio technology portfolio which executes a basic research program under the joint Chem-Bio Defense Program. Agency research interests are coordinated with those of DARPA and Service basic research programs through the Defense Basic Research Advisory Group. DTRA will review its research interests at least annually to focus on those technology areas not clearly addressed by other basic research efforts.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---------------------------------------|---------|---------|---------|
| Basic Research for WMD Knowledge Gaps | 0.000 | 0.000 | 5.000 |

FY 2005 Accomplishments:

- Not Applicable.

FY 2006 Plans:

- Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
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FY 2007 Plans:

- Initiate basic research efforts, as funding permits, the interest areas of transport models, equipment/personnel protection methods, effects of ionizing radiation, counter WMD weapons effects models, novel sensor materials, threat attribution, and mission impact to complex systems.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Procurement methods include in-scope award through DTRA University Strategic Partnership, collaborative funding through other organizations, and competitive award through Broad Agency Announcement.

E. Major Performers: Not Applicable.

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Exhibit R-2, RDT&E Budget Item Justification

Date: February 2006

APPROPRIATION/BUDGET ACTIVITY

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

R-1 ITEM NOMENCLATURE:

WMD Defeat Technology; 0602716BR

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Total 0602716BR Cost | 244.729 | 205.370 | 213.152 | 216.594 | 221.359 | 229.079 | 235.379 |
| Project BB Small Business Innovative Research* | 0.000 | 2.316 | 2.411 | 2.390 | 2.424 | 2.426 | 2.429 |
| Project BD Weapons Effects Technologies | 67.185 | 74.567 | 76.462 | 76.647 | 77.916 | 79.863 | 81.857 |
| Project BE Testing Technologies & Integration | 13.270 | 24.479 | 19.946 | 20.200 | 20.143 | 20.249 | 20.423 |
| Project BF CP Operational Warfighter Support | 91.792 | 93.189 | 97.315 | 99.685 | 103.160 | 106.617 | 108.914 |
| Project BG Nuclear Operations | 72.482 | 10.819 | 17.018 | 17.672 | 17.716 | 19.924 | 21.756 |

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

A. Mission Description and Budget Item Justification:

The mission of the Defense Threat Reduction Agency (DTRA) is to safeguard America and its allies from weapons of mass destruction (WMD) by providing capabilities to reduce the present and future threats. The approach to this challenge is contained within the three pillars of the DTRA mission**: non-proliferation, counterproliferation and consequence management. This program element specifically funds technologies necessary to defeat the threat from WMD.

Project BD, Weapons Effects Technologies provides the basic and applied research and development to support the technical underpinning for the next generation of agent defeat, deny and disrupt counterforce weapons to meet WMD threat. This project seeks answers to these challenges by using state-of-the-art science and engineering capabilities, novel payload development and evaluation capability, and precision laboratory and field experimentation.

Project BE, Testing Technologies & Integration provides a unique, simulated WMD national test bed capability for facility characterization, weapon-target interaction, and facility defeat testing by developing and maintaining test beds used by the DoD, the Services, the Combatant Commanders and other federal agencies to evaluate the implications of WMD, conventional, and other special weapon use against military or civilian systems/targets.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | R-1 ITEM NOMENCLATURE: WMD Defeat Technology; 0602716BR | |

Project BF, CP Operational Warfighter Support 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.

Project BG, Nuclear Operations provides initiatives to locate, detect, defeat, and investigate the use of Weapons of Mass Destruction (WMD) against the U.S. and its allies. In accordance with the Nuclear Posture Review, the objective is to dissuade potential adversaries, whether nation states, terrorist groups, or criminal organizations, from using asymmetric means of war.

B. Program Change Summary:

| (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---|----------------|----------------|----------------|
| Previous President's Budget | 245.471 | 206.487 | 216.206 |
| Current President's Budget | 244.729 | 205.370 | 213.152 |
| Total Adjustment | -0.742 | -1.117 | -3.054 |
| Congressional program reductions | | | |
| Congressional reductions | | -3.117 | |
| Congressional increases | | 2.000 | |
| Reprogramming | | | |
| Classified Program Transfer | | | |
| Other Program Adjustments | -0.148 | | -3.054 |
| SBIR/STTR Transfer | -0.594 | | |

Change Summary Explanation:

- The decrease in the FY 2005 funding profile from the previous submission to the current President's Budget is the result of a Small Business Innovative Research (SBIR) funding transfer and a reduction to support the Department of Energy. During the year of execution, SBIR funding is consolidated into PE 0605502BR "Small Business Innovative Research" for execution.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | R-1 ITEM NOMENCLATURE: WMD Defeat Technology; 0602716BR | |

- The decrease in FY 2006 from the previous submission to the current President's Budget is the result of the FY 2006 DoD Appropriation Act (P.L. 109-359) that contained several undistributed Congressional reductions applied to the entire DTRA RDT&E program. This program received a -\$3.117 million reduction. This program received Congressional increases in the amount of \$2.0 million.
- The net decrease of \$3.054 million in FY 2007 from the previous submission to the current President's Budget reflects program reprioritization offset by an increase of \$3.056 million for non-pay purchase inflation. The decrease primarily reflects the realignment of funding within DTRA research and development resources to initiate a Basic Research program to support areas that are critical to the Department of Defense maintaining technological superiority. The decrease also reflects a technical adjustment in support of a classified program and reflects funding realignments in support of the Strategic Command (STRATCOM). DTRA's program priorities are linked to the Combatant Commanders.
- Funding is used to support high priority combat support requirements in accordance with current planning, assumptions and associated requirements, address critical infrastructure requirements and implement the business reform initiative. It also balances the program consistent with strategic priorities within DTRA and the Department of Defense.
- The resulting program provides for a flexible combat support structure; focused science and technology investments, to include: critical areas like WMD target defeat and nuclear weapons effects technologies; defeat 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: Not Applicable.

E. Performance Metrics: Cost, schedule and performance are monitored via a combination of Earned Value Management System, Cost Schedule Status Reporting, and Cost Funds Status Reports.

** Tasking for this mission is contained in the National Security Strategy, Unified Command Plan (UCP), National Strategy to Combat WMD (NSPD-17), Counterproliferation Interdiction (NSPD-20), National Strategy for Combating Terrorism, National Military Strategy, Strategic Planning Guidance (SPG), Contingency Planning Guidance (CPG), National Military Strategy for Combating WMD, National Military Strategic Plan (NMSP) for the War on Terrorism (WOT), Joint Strategic

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
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Capabilities Plan (JSCP) (including the Nuclear Annex), Security Cooperation Guidance (SCG), Quadrennial Defense Review (QDR), Nuclear Posture Review (NPR), and Defense Transformation Planning Guidance (TPG).

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BB – Small Business Innovative Research | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---------|---------|---------|---------|---------|---------|---------|
| Project BB-Small Business Innovative Research | 0.000 | 2.316 | 2.411 | 2.390 | 2.424 | 2.426 | 2.429 |

A. Mission Description and Budget Item Justification:

To prepare for critical future WMD mitigation technology needs, WMD related advanced technology programs will invest in a balanced program of high leverage technologies that will yield improved WMD capabilities across a broad range of WMD defeat, WMD Defense, and an innovative science and technology programs. DTRA maintains a specific effort with minority and disadvantaged business; to include Historically Black Colleges and Universities/Minority Institutions and businesses. Each program and investment will focus, to the maximum extent feasible, on innovative WMD related technologies in support of future WMD mitigation capabilities. An important goal of each effort is to identify, develop, and demonstrate WMD related innovative technologies which will dramatically improve WMD Defense and Defeat performance.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---|---------|---------|---------|
| Small Business Innovative Research (SBIR) | 0.000 | 2.316 | 2.411 |

FY 2005 Accomplishments:

- Not Applicable.

FY 2006 Plans:

- Fund 43.6 percent of DTRA SBIR investment including:
 - Up to ten Phase I SBIR contracts from proposals from FY 2006 topic areas including WMD Dispersal Device Defeat, Advanced X-ray Simulator; Next Generation Blast Mitigation, Weapons of Mass Destruction (WMD) Hazard Modeling and Simulation, Integrated WMD Toolset Near Real Time Response, Chemical/Biological Agent Deny and Defeat, Enhanced Deep Earth Penetration Capability, and Energetic Materials and Weapon Concepts.
 - Up to two Phase II SBIR contracts to perform full research and development on promising FY 2005 Phase I efforts.

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- Share of incremental funding of FY 2005 Phase I and FY 2004 Phase II SBIR contract awards.

FY 2007 Plans:

- Fund 43.0 percent of DTRA SBIR investment including:
 - Up to ten Phase I SBIR contracts to perform feasibility studies on FY 2007 topics.
 - Up to two Phase II SBIR contracts to perform full research and development on promising FY 2006 Phase I efforts.
 - Share of incremental funding of FY 2006 Phase I and FY 2005 Phase II SBIR contract awards.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---------|---------|---------|---------|---------|---------|---------|
| Project BD - Weapons Effects Technologies | 67.185 | 74.567 | 76.462 | 76.647 | 77.916 | 79.863 | 81.857 |

A. Mission Description and Budget Item Justification:

This project provides an over-arching framework for all Chemical, Biological, Radiological, Nuclear and high Explosive (CBRNE) related modeling and simulation tools. Initiatives supported by this project include, but are not limited to, such activities as follow:

- **Targeting Support:** Provides the warfighter and military engineers with state-of-the-art weapons effects models, structural dynamic models and computational tools for use in weapon selection, post strike assessment and force/mission protection. Develops, validates, and verifies lethality/vulnerability (L/V) models and integrates those models into computational tools for expedient or deliberate pre-strike planning, post-strike assessment, intelligence analysis, and other related missions. Targeting Support also provides technology, tools and expertise in the areas of forensic analysis, vulnerability assessments and weapon/structure interactions in support of anti-terrorism and force protection missions.
- **Environments:** The objective of this activity is to provide the DoD nuclear weapon effects modeling and simulation, common DoD nuclear weapon stockpile and foreign nuclear weapon standard data handbooks for use in developing modeling and/or predictions of effects, and to provide DoD subject matter expertise in nuclear weapon effects for joint DoD and Department of Energy nuclear studies and operational exercises. Specific modeling efforts include high altitude detonations ranging from altitudes of 20 to hundreds of kilometers and surface/buried detonations. This activity provides DoD's only operational and advanced nuclear computational capabilities for use on net-centric information systems by combatant commanders and senior DoD leaders.
- **Hazardous Prediction and Assessment Capability/Consequence Assessment:** The objective of this activity is develop an automated software system to provide the means to accurately predict the effects of hazardous material released into the atmosphere and its impact on civilian and military populations. The system uses integrated source terms, high-resolution weather forecasts and atmospheric transport & dispersion analyses to model hazard areas produced by military or terrorist incidents and industrial accidents. The software developed supports the DoD's Chemical and Biological Defense Program.
- **Advanced System and Concepts:** Supporting, maintaining and sustaining the weapons of mass destruction technology base. Seeks to capitalize on expertise developed through DoD, other U.S. government, and non-government supported research in various

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology | |

technologies. Additionally identifies gaps within these capabilities and initiates programs to fill them.

- In accordance with House Report 109-359, funds a study at Center for Nonproliferation Studies, Monterey Institute of International Affairs. This effort conducts strategic studies and analyses related to national and international security, CBRNE threats, homeland defense, and the global war on terrorism. This includes state and non-state proliferation-related activities, and the means and capabilities necessary to effectively and efficiently combat both current and potential CBRNE threats.
- Modeling and Simulation (M&S): The objective of this activity is to provide validated M&S tools to enable rapid access for planning, emergency response and assessment capabilities across a broad spectrum of conventional, unconventional and nuclear scenarios. Significant initiatives focus on extending legacy and future capabilities through web-services and web-browser based delivery methods. The enterprise architecture will allow DoD, government agencies, first responders, planners, managers and operational and technical personnel to have a common computation and planning capability that is web-enabled.
- WMD Counterforce Applications: Developing and validating Chemical and Biological Weapon (CBW) defeat and disrupt weapon effectiveness and collateral release diagnostics for the warfighter to mitigate the impact of the effects of weapons of mass destruction on all aspects of warfighting, to include communications, radar and optical sensor systems. Seeks to predict the response of systems that must operate in WMD disturbed environments.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Targeting Support | 18.345 | 16.460 | 16.355 |

FY 2005 Accomplishments:

- Modernized DTRA's conventional and nuclear weapon selection software, Integrated Munitions Effects Assessment (IMEA). The new version of this M&S tool predicts ground shock in 3 dimensions, accurately predicts the effect of two penetrating conventional bombs aimed at the same location, includes an improved penetration model, improved efficiency of the cratering model, and provides a revolutionary way of gauging the penetration capability for bombs against hardened bunkers. As a result, the software allows pilots and crews to instantly determine optimal release conditions and better aim points. The software also provides accurate prediction for skip-bomb attacks into tunnels to support U.S. Air Forces in Korea. Initiated 2-year plan to

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interface IMEA with U.S. Air Force and U.S. Navy mission planning systems for automatic transfer of weapon selection information.

- Delivered the Integrated Weapons of Mass Destruction Tool Set for Targeting Support (IWMDT/TS) version 1.0, which implemented IMEA in a web enabled environment. Initiated IWMDT/TS interface with Joint Forces Command's (JFCOM's) nationwide simulation training network to provide Battle Damage Assessment Training for all US forces.
- Leveraging the IMEA effort, delivered to COCOM Vulnerability Assessment Teams the first release of DTRA's force protection software, Vulnerability Assessment and Protection Option (VAPO), for use in conducting assessments of the vulnerability of U.S. assets (buildings etc) to terrorist threats.
- Conducted scaled-down tests to validate and improve IMEA and VAPO models. Testing improved prediction of structural damage from weapons detonation below burster slabs and validated IMEA and VAPO fragmentation models. Conducted 12 explosive tests on steel framed structures to develop and validate a structural response model. Designed and began construction of a wooden test building consistent with DoD's Unified Facilities Criteria (UFC) for development of models on how to prevent/resist progressive collapse. Improved the curvilinear penetration model to better predict small diameter projectile penetration into concrete. Improved tunnel airblast modeling and improved vulnerability information on enemy equipment to better predict damage from airblast.
- Completed software migration projects to prepare major DTRA codes for operation on new parallel processor architectures provided by DoD High Performance Computing Modernization Program (HPCMP). Completed migration of all computational, storage, and networking services to in-house and DoD HPCMP sources. Consolidated in-house operational support.
- Congressional Increase. Worked with the National Center for Blast Mitigation and Protection (George Mason University, Fairfax, VA) and developed a PC-based computational Fluid dynamics (CFD) code and interfaced it with the VAPO tool.

FY 2006 Plans:

- Capability Enhancement: Deliver Integrated Munitions Effects Assessment (IMEA) 7.0 with enhanced penetration and cratering models, as well as updated nuclear prediction capabilities. Implement enhanced Underground Targeting and Analysis System (UTAS) network-wide functional defeat and special operations planning and target visualization functionality in the IMEA/UTAS tool. Continue interfacing IMEA with U.S. Air Force and U.S. Navy mission planning software to rapidly pass weapon selection information.
- Improve integration of IMEA capabilities in the Net-Centric architecture, Integrated Weapons of Mass Destruction Toolset/

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Targeting Support (IWMDT/TS), to include streamlined capability to represent complex targets and increase the target set for JFCOM’s simulation network (to include bridges and communications centers). Complete the interface of IWMDT/TS with Counterproliferation Planning System (CaPS) and Joint Targeting Toolbox (JTT).

- Field VAPO 1.0 to assessment teams for Joint Staff Integrated Vulnerability Assessments (JSIVA) of DoD facilities worldwide, and for Balanced Survivability Assessments to help ensure mission readiness of U.S. critical infrastructure worldwide. Deliver VAPO 2.0 for force protection planning worldwide.
- Implement penetration data from tests of weapons against multi-story buildings to improve weapon selection methods against these targets. Update tunnel reconstitution model with test data gathered from live fire test series called: DIVINE HELCAT.
- Decommission in-house Cray computer. Complete the transition plan to streamline the Agency’s HPC operations. Maximize user access to DoD (High Performance Computing) HPC Modernization Program assets as the sole source of high-end computational resources.
- Congressional Increase. Continue effort with National Center for Blast Mitigation and Protection (George Mason University, Fairfax, VA) and deliver a personal computer (PC)-based computations structural dynamics (CSD) capability.

FY 2007 Plans:

- Deliver IMEA 8.0 with newly approved collateral effects and modeling information for new weapon systems. Complete the interface with USAF and USN mission planning software. Begin integration of IMEA with real-time sensors.
- Through the Integrated Weapons of Mass Destruction Toolset architecture, fully integrate IMEA capabilities into the Global Information Grid (GiG) and Network-Centric Enterprise Services (NCES) providing broader counterforce support to warfighter.
- Develop mitigation technologies to protect U.S. assets from Chemical, Biological, Radiological, Nuclear and High Explosive weapons, develop associated models for future upgrades of VAPO. Deliver upgraded VAPO 3.0 with improved models for mitigation of terrorist threats against DOD facilities and missions worldwide. Establish an antiterrorism assessment modeling cell to conduct initial assessments and model development to provide assistance to VAPO users when conducting their vulnerability assessments. This cell will also help VAPO users to develop protective solutions for improving survivability of people in facilities subjected to terrorist attacks.
- Perform simulations of WMD operational defeat demonstrations using DTRA’s Facility-3 testbed and compare the results. Initiate development of fast-running airblast model for complex geometries in the areas of weapon-target interaction computer codes, component vulnerability/equipment fragility, human lethality, and quasi-static damage and dispersion.

UNCLASSIFIED

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology |

- Provide high-end computational support to the R&D modeling and simulation community by leveraging the resources of the DoD HPC Modernization Program. Through expert technical support, tailored to DTRA performers, ensure that researchers obtain the maximum benefit from this computational environment.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Environments | 14.472 | 20.732 | 23.472 |

(Re-titled in FY 2005 from Nuclear Phenomenology)

FY 2005 Accomplishments:

- Updated the DoD nuclear weapon stockpile and foreign nuclear weapon standard data handbooks to include improvised and terrorist devices. This provides DoD better prediction capability of potential threats to the U.S., allies, and deployed forces. Developed new data characterizing radioactive weapon debris for use in improved nuclear weapon fallout modeling, initiated a second round of subject matter expert peer review of a new textbook on nuclear weapon effects, and improved the DoD archival nuclear weapon database system by adding a new version of high altitude modeling codes.
- Modernization. Initiated transition of legacy modeling and simulation (M&S) into modern, net-centric nuclear weapon effects M&S capabilities supporting combatant commands and defense agencies in nuclear targeting, consequence assessments, predicting effects on key systems, critical military system survivability designs, and battle simulations. Demonstrated high-fidelity dispersion of nuclear materials in urban areas, refined methods for bio-agent defeat, continued development of an advanced 3-Dimensional code to predict weapon effects on structures and WMD agents, continued advanced development of near surface low-yield nuclear effects in city (terrorist use of nuclear weapons), developed concepts and tools for enhanced mechanisms to kill biological agents, and began reducing the computational run time of DoD’s advanced space weather prediction model for satellite and other space system analyses.
- Supported U.S. Strategic Command and other warfighters and agencies by providing nuclear weapon effects training using the improved nuclear codes. Provided subject matter expert support to the U.S. Strategic Command during wargame exercises that included nuclear weapons.

UNCLASSIFIED

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FY 2006 Plans:

- Continue to improve the DoD nuclear weapon stockpile and foreign nuclear weapon standard data handbooks to include improvised and terrorist devices to provide DoD better prediction capability of potential threats to the U.S. Begin updating and modernizing DoD's nuclear weapon effects manual to provide the baseline for all nuclear weapon effects analysis and prediction capabilities.
- Continue transforming legacy modeling and simulation into modern, net-centric nuclear weapon effects modeling and simulation capabilities. Research will include advanced computation methods for nuclear events in space to improve operational prediction abilities, provide U.S. Strategic Command with improved nuclear cloud modeling and the ability to predict the effects from multiple, simultaneous nuclear weapon detonations, continue research in modeling of low-yield nuclear blasts in urban environments. Develop an advanced 3-Dimensional code to predict nuclear weapon effects.
- Support U.S. Strategic Command and others by providing operational and advanced nuclear weapon effects training using the improved nuclear codes, and provide Combatant Commands nuclear weapon subject matter expert support during wargame exercises.

FY 2007 Plans:

- Continue to improve the DoD nuclear weapon stockpile and foreign nuclear weapon standard data handbooks by using two and three dimensional computations. Threat weapons include improvised and terrorist devices to provide DoD better prediction capability of potential threats to the U.S. Continue updating and modernizing DoD's nuclear weapon effects manual to provide the baseline for all nuclear weapon effects analysis and prediction capabilities.
- Continue transforming legacy modeling and simulation into modern, net-centric nuclear weapon effects modeling and simulation capabilities. Continue the advanced research begun in FY 2006, plus begin research to develop four dimensional (3D plus time) nuclear weapon effects modeling to support net-centric battle simulations. Provide combatant commanders improved decision making tools.
- Continue to provide operational and advanced nuclear weapon effects training using the improved nuclear codes and provide Combatant Commands nuclear weapon subject matter expert support during wargame exercises.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---|---------|---------|---------|
| Hazard Prediction and Assessment Capability (HPAC)/Consequence Assessment | 15.966 | 14.878 | 15.272 |

FY 2005 Accomplishments:

- Completed HPAC 4.04 Service Pack 3. Provide full Hazard Prediction and Assessment Capability/Consequence Assessment Tool Set (HPAC/CATS) functionality for Integrated WMD Toolset (IWMDT). This is a web-based access to all consequence assessment tools; restricted version of HPAC 4.04 Service Pack 3 to meet Strategic Command's (STRATCOM) consequence of execution requirements; validation of urban dispersion modeling capability using data from Mock Urban Setting Test (MUST).
- Initiated integration of population movement (day and night) and evacuation algorithms with casualty estimation models; continued integration of hazard prediction tools into OSD Joint Effects Module Block 1; integrated military medical planning capability Nuclear-Biological-Chemical (NBC) Casualty and Resource Estimation Support Tool in coordination with the U.S. Army Office of the Surgeon General.
- Linked (HPAC's) atmospheric transport to the Oak Ridge National Laboratory's Hydrologic Transport Assessment System (HYTRAS), a water borne transport model via U.S. Navy funded support of the U.S. Coast Guard (USCG) homeland security - counterterrorism mission in rivers and estuarine areas (littoral region).
- Continued development of water transport model in collaboration with U.S. Navy, National Ocean Service, industry and academia; high-fidelity mesoscale weather forecasting model development to include littorals, complex terrain and urban environments and NWP ensemble techniques; Numerical Weather Prediction (NWP) and Transport and Dispersion (T&D) model coupling; and provided integrated weather data from multiple sources for use in HPAC for operational hazard predictions that more fully account for uncertainty in weather observations and forecasts; 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; Air Force Combat Climatology Center (AFCCC) Environmental Scenario Generator (ESG) for use in HPAC applications.
- Provided technical and operational support to OSD, Joint Staff, and combatant command contingency operations and exercises.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology | |

FY 2006 Plans:

- Continue to develop consequence assessment software for integration into net-centric capabilities to meet DoD Global Information Grid requirements allowing for transition of hazard prediction capabilities into Chem-Bio (CB) Defense Joint Effects Model Block 2; CB Source Term, Industrial Facility and Transportation models; development and integration of hazard prediction tools such as atmospheric transport and dispersion and urban modeling into OSD Joint Effects Module (JEM) Block 1 and improve water transport models in collaboration with the U.S. Navy, National Ocean Service, industry and academia.
- Continue high-fidelity mesoscale weather forecasting model development to include littorals, complex terrain and urban environments; conduct research and development into Numerical Weather Prediction (NWP) and Transport and Dispersion (T&D) model coupling and NWP ensemble techniques to more appropriately characterize uncertainty in T&D calculations; and 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.
- Initiate development of updated climatological, terrain and landuse data sets, into JEM and HPAC. Develop and integrate improved nuclear weapon fallout methods to improve assessments in urban areas and long-term impacts for use by USSTRATCOM, USNORTHCOM, and the homeland defense community.
- Complete integration of casualty resource estimation planning capability into consequence assessment tools in support of U.S. Army Office of the Surgeon General.

FY 2007 Plans:

- Initiate development and integration of economic and environmental assessment methods resulting from nuclear or radiation contamination for use by USSTRATCOM, USNORTHCOM, and the homeland defense community.
- Continue high-fidelity mesoscale weather forecasting model development to include littorals, complex terrain and urban environments; conduct research and development into Numerical Weather Prediction (NWP) and Transport and Dispersion (T&D) model coupling and NWP ensemble techniques to more appropriately characterize uncertainty in T&D calculations; and 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.
- Continue development of CB Source Term, Industrial Facility and Transportation models. Complete conversion and integration into IWMDT and Chem-Bio Defense Joint Effects Model. Continue development and integrate improved water transport models in collaboration with the U.S. Navy, National Ocean Service, industry and academia.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology |

- Integrate updated climatological, terrain and landuse data sets, into JEM and HPAC.
- Complete development of consequence assessment software for integration into net-centric capabilities to meet DoD Global Information Grid requirements. Transition of hazard prediction capabilities into Chem-Bio Defense Joint Effects Model Block 2.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---|---------|---------|---------|
| Advanced Systems and Concepts Office (ASCO) | 10.060 | 9.846 | 8.991 |

FY 2005 Accomplishments:

- Examined the use of nuclear weapons on U.S. soil, including other nation states, near-peer competitors, non-state actors and warhead detonations on undefended targets in the absence of missile defenses. Identified implications for U.S. and Russian interaction with a U.S. missile defense engagement against a North Korean ballistic missile attack at targets on the U.S. west coast. Examined the effectiveness of the current export control regime, and identified possible enhancements. Produced an analytical framework for evaluating trade-offs among the three legs of the New Triad, involving varying acquisition priorities on active defense, offensive strike, and responsive nuclear infrastructure. Evaluated the current state of the proliferation-related multilateral export control regimes
- Determined the laws and regulations that would apply if a WMD incident occurred on a U.S. facility in Europe or in the case of a European country’s request for assistance in the event of a WMD event. Identified new technological opportunities and doctrinal developments to strengthen the effectiveness of U.S. and allied military forces in their deterrence of, and defense against, the use of WMD by potential adversaries in the full spectrum of operations. Evaluated the current state of the proliferation-related multilateral export control regimes. Established a basis for using comparative strategic culture as a threat assessment and anticipation methodology. Furthered the development of a Joint Threat Anticipation Center. Completed two major multi-phased “proof of concept” modeling projects.
- Provided support to Nonproliferation Treaty Review Conference and Biological Weapons Review Conference. Identified those issues the U.S. needed to be prepared to address during the review conference, and developed recommended negotiating approaches and proposals for DoD consideration. Initiated student research program to encourage the next generation of analysts, primarily in research and development.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology | |

- Conducted a quarantine discussion for the San Diego military/civilian community. Results of the exercise were published in the CDC’s journal, Emerging Infectious Diseases.

FY 2006 Plans:

- Identify DoD nuclear weapons infrastructure elements to support the Nuclear Posture Review and other strategic planning requirements.
- Investigate nontraditional methods to defeat difficult special targets with an emphasis on innovation.
- Conduct a study on Novel Energetics (non-nuclear) to provide a science and technology assessment and roadmap for investment in developing DoD capabilities in conventional strike.
- Evaluate potential directions and investment in high energy physics science and technology developments.
- Conduct a study of the effectiveness of non-pharmacologic disease containment measures which examines primary source material to determine which of these measures appeared effective in controlling the spread of the H1N1 flu virus during the 1918 Spanish Influenza Pandemic’s second wave.

FY 2007 Plans:

- Continue systems analysis studies to predict new WMD threats.
- Continue to stimulate, identify, and execute high-impact, innovative 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 2005 | FY 2006 | FY 2007 |
|---------------------------------|---------|---------|---------|
| Modeling and Simulation Program | 5.096 | 8.651 | 8.372 |

FY 2005 Accomplishments:

- Deployed on DTRA computer systems the only full-spectrum Web-Browser based Chemical Biological Radiological Nuclear and Explosive (CBRNE) assessment tool; providing immediate shared direct and indirect support capabilities across DoD, HLS, and

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state and federal agencies. Extended stand-alone capabilities into the DTRA enterprise architecture by enabling customized scenario development, enhanced tunnel and hard target defeat, initial NBC reporting capability, and improved security standards. A unique aspect of this effort is a design requiring no local software load for full operational capability, which eliminated all local certification and installation requirements.

- Provided an accredited simulation system to Joint Forces Command (JFCOM) by extending the IWMDT capabilities into a simulation network environment which allowed shared database and operational impact visualization. Unique aspect of this effort is the cross platform, accredited process and network based approach of CBRNE targeting.
- Enhanced the collaboration between DTRA’s Integrated Theater Engagement Model (ITEM) with U.S. Air Force model THUNDER. ITEM is a fielded theater level analytical model capable of addressing the naval, air and land planning study goals in accordance with OSD J8 requirements. This collaboration improved accuracy of studies and reduced the time required to conduct complex studies across air, land and sea.
- Supported the Supreme Allied Headquarters Powers Europe (SHAPE) exercise and operational planning process through the direct and indirect apolitical terrain generation capability that is solely available through the Synthetic Exercise Environment (SEE) provided by DTRA. SEE is the only fielded coalition and combined integrated terrain and target database for nuclear planning and exercise support.

FY 2006 Plans:

- Expand the architecture scope for design and development to align DTRA initiatives with proposed DoD level efforts for CBRNE capabilities. This effort will extend internal and external CBRNE capabilities to operational and strategic users in a timely and reliable manner.
- Develop and implement a DITSCAP compliant security process across the enterprise architecture for all native components. Implementing this capability allows broader internal and external integration and promotes Joint Program Office-Chem-Bio Defense and DTRA collaboration. This collaboration results in consistent fielding of validated and secure component capabilities more rapidly and repeatable.
- Enhance the accredited simulation system capabilities to include multi-layer security exercise support through the enhanced IWMDT enterprise architecture. Provide a broad integrated analytical/operational capability through the IWMDT architecture, baselined on current theater level analytical user requirements. This effort provides a consistent and accredited response across

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology |

operational, analytical, and exercise scenarios.

FY2007 Plans:

- Fully integrate external command and control and ISR capabilities across the Integrated WMD Toolset (IWMDT) enterprise architecture. This will provide DTRA full situational awareness as it supports STRATCOM's Combating WMD Center.
- Fully integrate all DTRA CBRNE capabilities and transition the delivery method of DTRA capabilities from stand-alone heterogeneous applications into a net-centric architecture that meets existing and emerging requirements.
- Fully integrate simulation capabilities across IWMDT enterprise architecture through external application services-based functionality. Broadly integrate analytical/operational capabilities with a fully integrated multi-user interface and remote access capability.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-------------------------------|---------|---------|---------|
| WMD Counterforce Applications | 3.246 | 4.000 | 4.000 |

FY 2005 Accomplishments:

- Initiated chemical weapon Agent Defeat technology research to explore new capabilities for defeating chemical agents. Continued development of innovative Agent Defeat payloads.

FY 2006 Plans:

- Continue development of innovative Agent Defeat technologies and their weaponization to include variable terminal effects concepts. Initiate development and validation of live agent tunnel test diagnostic technology for the evaluation of Agent Defeat variant weapons designed for employment against Hard and Deeply Buried targets.

FY2007 Plans:

- Initiate development of a directed energy centric Agent Deny/Disrupt payload. Continue development of diagnostic systems to support testing of live agents in tunnels. Continue research and development of forensic Agent Defeat payload concepts for real time Battle Damage Assessment of Counter-WMD missions. Begin development of soft target agent defeat technologies.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BD – Weapons Effects Technology | |

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: L3/Titan, Science Applications International Corporation, Applied Research Associates, Mission Research Associates, DOE/Oak Ridge National Laboratory, Penn State University, National Center for Atmospheric Research.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BE – Testing Technologies and Integration |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---------|---------|---------|---------|---------|---------|---------|
| Project BE - Testing Technologies and Integration | 13.270 | 24.479 | 19.946 | 20.200 | 20.143 | 20.249 | 20.423 |

A. Mission Description and Budget Item Justification:

Provide a unique national test capability for simulated Weapons of Mass Destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs by developing and maintaining test beds used by the 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. Leverage 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). Maintain testing infrastructure to support the testing requirements of warfighters, other government agencies, and friendly foreign countries on a cost reimbursable basis. Creates testing strategies and a WMD test bed infrastructure focusing on the structural response of buildings and Hard & Deeply Buried Targets (HDBT) that house nuclear, biological, and chemical facilities. 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 programs supported include:
 - Tunnel Target Defeat (TTD) Advanced Concept Technology Demonstration;
 - Hard Target Defeat (HTD);
 - WMD Counterforce
 - Combating Terrorism;
 - Special Operations Forces (SOF).
- 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:

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BE – Testing Technologies and Integration | |

- PE 0602717BR - Project BC;
- PE 0602716BR - Projects BD & BF;
- PE 0603160BR - Projects BJ & BK.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------------|---------|---------|---------|
| Test and Technology Support | 11.270 | 12.009 | 12.112 |

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

FY 2005 Accomplishments:

- Provided unique test capabilities for weapon-target interaction and Weapons of Mass Destruction (WMD) programs. DTRA supported 171 tests for the Tunnel Target Defeat (TTD) Advanced Concept Technology Demonstration (ACTD), Service support, the Thermobaric ACTD, Hard Target Defeat demonstrations, Combating terrorism, the Department of State, structural response testing for the UK, and general phenomenology. 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. Continued developing a Program Environmental Impact Statement (PEIS) to support DTRA in proposed expansion of testing and related activities at White Sands Missile Range (WSMR). Continued to standardize logistics, operations and support across test sites, including simulators, and integrate infrastructure development and improvement. Conducted structural response tests at the Large Blast/Thermal Simulator (LB/TS).

FY 2006 Plans:

- Continue to provide unique national test capabilities for weapon-target interaction and WMD threat reduction programs. Provide an inventory of unique targets, infrastructure support, and expertise for conduct of major integrated test programs supporting the TTD ACTD, Combatant Commanders, the Services, international partners, and DTRA’s enterprise areas and campaigns. Support Program Environmental Impact Statement (PEIS) process to support DTRA in proposed expansion of testing and related activities at WSMR.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BE – Testing Technologies and Integration | |

Resource infrastructure support to standardize logistics, operations and support across test sites, including Nuclear Weapons Effects 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 2007 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. This project supports many of the Agency’s test efforts described in this and other program elements.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|--|---------|---------|---------|
| Infrastructure Development and Improvement | 2.000 | 2.000 | 2.000 |

(Re-titled in FY 2005 from Field Support)

FY 2005 Accomplishments:

- Provided infrastructure supporting the test program. Cleaned up and remediated legacy test sites including the Advanced Research Electro Magnetic Pulse Simulator. Conducted post-test clean up at White Sands Missile Range (WSMR) and Chestnut Test Site, Kirtland Air Force Base, New Mexico. Purchased an additional Rotary Percussion Sounding System (RPSS) and upgraded the original system. RPSS is used to geologically characterize test sites pre- and post-test. Completed instrumentation bunkers for the Capitol Peak tunnel site at WSMR and the Nevada Test Site (NTS). The new bunkers will protect data recording assets during large blast tests. Completed the Concrete Batch Plant upgrade to facilitate mixing of concrete with exact specifications to replicate various real world facilities.

FY 2006 Plans:

- Continue to provide infrastructure supporting the test program. Activate mobile office test team facility at Chestnut Test Site. Procure additional cameras for the Tunnel Target Defeat ACTD. Continue Magnetic Flyer Plate facility remediation. Remove the 20-foot shock tube from the Giant Reusable Air Blast Simulator (GRABS) site at Kirtland Air Force Base, New Mexico.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BE – Testing Technologies and Integration |

FY 2007 Plans:

- Continue to provide infrastructure support including 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. Continue Test bed remediation. Initiate planning for buildings to support testing events at Permanent High Explosives Test Site (PHETS).

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------------------|---------|---------|---------|
| Environmental Restoration Support | 0.000 | 10.470 | 5.834 |

(Re-titled in FY 2005 from Field Support)

FY 2005 Accomplishments:

- Not Applicable.

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: Not Applicable.

UNCLASSIFIED

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BE – Testing Technologies and Integration | |

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: Applied Research Associates, Inc, located in New Mexico, and the Department of Energy/Nevada Operations.

UNCLASSIFIED

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BF - CP Operational Warfighter Support |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|--|---------|---------|---------|---------|---------|---------|---------|
| Project BF - CP Operational Warfighter Support | 91.792 | 93.189 | 97.315 | 99.685 | 103.160 | 106.617 | 108.914 |

A. Mission Description and Budget Item Justification:

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.** Provides the warfighter with the capabilities and understanding for countering the use and effect of WMD and weapons of mass effects (WME) through the advancement of simulation technology, assessment of operational impact, development of collaborative capabilities and access to mature computer models. Provides an interface between DTRA model developers and the weapons effects simulation community to ensure relevance of DTRA models in interactive simulations through compliance with standards and protocols. Uses 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. Provides the Agency's portal for providing DoD Transformation and Experimentation support for Chemical, Biological, Radiological/Nuclear, and Explosive (CBRNE) events. 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.
- Hard Target Defeat Program.** The United States and its allies face a growing threat from critical military targets hidden within and shielded by hardened, deeply buried tunnel complexes. These complexes can house biological/chemical/nuclear weapons production or storage facilities; command, control, and communications facilities; and/or theater ballistic missiles with their transporter-erector-launchers (TELs). The purpose of this program is to develop, demonstrate, and transition to the warfighter end-to-end capabilities to defeat Hard & Deeply Buried Targets (HDBT). These end-to-end capabilities embody synergistic effects of optimizing attack planning,

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BF - CP Operational Warfighter Support | |

the weapon and kill mechanism, and the tactics techniques and procedures necessary to defeat a spectrum of HDBT. These tasks support warfighting requirements derived from the Hard and Deeply Buried Target Defeat Initial Capabilities Document (ICD) and research, development, test and evaluation (RDT&E) priorities set by the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. As recommended in HDBTD Science and Technology Master Plan this project develops advanced energetics and weapon concepts and technologies for tunnel defeat. The plan also called for an increased level of 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. The tests are conducted at National Testbeds for the tunnel defeat community, including the Intelligence Community.

- Special Projects.** The Special Projects effort is an outgrowth of the targeting and characterization work previously performed under the Hard Target Defeat Program. 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. 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 technologies for detecting, locating, identifying, physically and functionally characterizing, modeling, and assessing new and existing hard and deeply buried targets to support full dimensional defeat operations. 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.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|--------------------------------|---------|---------|---------|
| Operational Support Technology | 10.459 | 8.649 | 7.780 |

UNCLASSIFIED

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FY 2005 Accomplishments:

- Validated integration of Global Command and Control System/Hazard Prediction and Assessment Capability during Combined Warfighter Interoperability Demonstration 05.
- Established initial test capability for Weapons Analysis Lethality Toolset (WALTS) version 2; integrated WALTS at the ranges at Garden City Combat Readiness Training Center, GA, Eglin AFB, Florida and Eielson AFB, Alaska.
- Focused on integrating coalition WME expertise with DTRA modeling and simulation through continued participation in the Joint Forces Command experimentation series such as Multinational Experiment-4 (MNE-4) and integration into warfighter C4ISR architecture while providing a virtual DTRA presence at JCS, USJFCOM, and Joint National Training Center (JNTC) exercises by remotely introducing WME events and overlaying them onto a common operational picture.
- Enhanced Systems Engineering across the agency by conducting modeling and simulation (M&S) verification and validation testing of WME related software development and life-cycle maintenance activities through the use of Rational software configuration management tools.
- Incorporated DTRA's Integrated WMD Toolset (IWMDT) into selected JNTC exercises and JCDE experiments/events/activities to support IWMDT design, testing, and verification and validation.

FY 2006 Plans:

- Complete DTRA Collaboration Center Initial Operational Capability while refining the requirements for Mid-Operational Capability to establish connectivity to coalition networks, forces, and organizations.
- Exploit international cooperation and decision support technologies with Defense Science and Technology Laboratory (Dstl)/UK and Defense Research and Development Canada (DRDC) by pursuing promising urban modeling capabilities such as OPTIPATH (DRDC) and SAFE (Dstl).
- Continue to provide a virtual DTRA presence at JCS, USJFCOM, and JNTC exercises by remotely introducing WME events and projecting them onto a common operational picture battle space as well as expanding DTRA CBRNE-focused participation in USJFCOM-led JCDE Joint Prototype and Joint Concept Development path efforts, including support to Effects Based Operations, Joint Interagency Coordination Group and Operational Net Assessment.
- Continue with the Systems Engineering efforts to support 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.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BF - CP Operational Warfighter Support | |

- Using the Systems Engineering approach, continue to conduct M&S verification and validation testing of WME-related software development and life-cycle maintenance activities.

FY 2007 Plans:

- As a “workbench” for Agency R&D Systems Engineering, fully integrate the DCC with the JNTC training network, to include CBRNE engineering/technical advice and support, warfighting tools, military/net assessments, field demos and tests, and advanced concept validation; develop a methodology and prototype decision support system for optimal placement and use of sensors; and validate technology like the Hilbert Engine which can search/correlate data from multiple sources to identify patterns that may be precursors to CBRNE/WMD related terrorist activity.
- Continue supporting JFCOM’s JCDE, Distributed Continuous Experimentation Environment (DCEE), Joint Systems Integration Command (JSIC), and program of record prototypes by expanding participation to include a full spectrum of modeling & simulation modules for CBRNE (using IWMDT), to include supporting the Chemical Biological Defense Program (CBDP).
- Begin integration of DCC, M&S and the Battle Lab into the Global Information Grid (GIG).

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|----------------------------|---------|---------|---------|
| Hard Target Defeat Program | 67.436 | 66.148 | 69.147 |

FY 2005 Accomplishments:

- Continued development of optimized explosive formulas. Down-selected most promising formulations for more extensive testing. Collected experimental data on new model of thermobaric explosive (TBX) formulations and refine TBX metrics. Accelerated development of high-payoff novel explosive concepts using advanced energetic materials. Continued investigation of aluminum combustion mechanisms and apply these to (TBX) formulation improvement. Developed formulation design techniques for improved energy coupling to targets. Developed improved explosive formulations based on use of coated micron- and/or nano-particles.
- Conducted non-energetic payload methodology down-select and completed Phase I report of non-energetic fill concepts. Conducted multiple proof-of-principle field tests for non-energetic advanced payload fills. These concepts render biological agents inert and cause electrical equipment and electronic devices to become inoperable.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BF - CP Operational Warfighter Support | |

- Conducted weapon phenomenology testing and analysis. Analyzed High Velocity (HV) penetration lab data evaluating oblique impacts of novel case shapes for advanced weapons. Developed portal extension engineering response model. Developed methodology to assess equipment fragility based on generic characterization. Developed algorithm for weapon trajectory stability in horizontal (skip bomb) delivery. Developed weapon penetration model for damaged materials.
- Analyzed effectiveness of massive ordnance penetration against hard and deeply buried targets and completed preliminary design. Refined Massive Ordnance Penetrator (MOP) concept and began detailed weapon development and testing. Planned statically emplaced Proof-of Principle test of effectiveness of Massive Ordnance payloads. Planned demonstration of massive ordnance air-blast lethality against a full-scale tunnel target.
- Conducted Enhanced Fuze Integrated BDI Demonstration (EFIBDID) system design and component tests. Executed static lethality tests of the I-500 penetrator weapon concept against tunnel targets and began detailed system design. Completed high-speed penetration lethality demonstration for advanced weapon concepts. Completed the feasibility study of the boosted penetrator. Assessed data from field impact tests of projectiles with unstable trajectory. Drafted the 2005 Hard and Deeply Buried Target Defeat Report to Congress.
- Integrated a fragment model with 1.5D (Dimension) airblast model into Integrated Munitions Effects Assessment (IMEA) version 6.0. Developed equipment fragility model for IMEA 6.0. Submitted IMEA version 6.0 for Joint Technical Coordinating Group (JTTCG) accreditation of equipment fragility models of Command, Control, Communications and Intelligence (C3I) facilities in tunnels. Improved blast door model and released IMEA 6.0. Updated nuclear planning tool IMEA-Nuclear. Supported COCOM HDBT defeat planning with the Targeting/Weaponing Assistance Cell.
- Tunnel Defeat Testing: Executed two intermediate scale tests to develop and validate models of tunnel facilities subjected to sever ground shock loading and began the design of a full-scale test to validate models. Conducted deep underground operational tunnel facility defeat demonstrations using advanced weapons at the White Sands Missile Range. Conducted reconstitution exercise and determined reconstitution time for C3I tunnel facility at Nevada Test Site (NTS). Completed preliminary design of simulated WMD production and storage tunnel complex and began planning for a demonstration of the functional defeat of such a complex. Conducted small-scale multistory building tests and model development. Conducted weapon tests of the 84mm Multi-Target Shoulder Launched round for Special Operations Command (USSOCOM) to include multiple fill analysis. Supported the Navy in the test and evaluation of the lethality of a high-speed penetrator warhead against a DTRA test bed (Tactical Missile System - Penetrator (TACMS-P). Conducted 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.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BF - CP Operational Warfighter Support | |

FY 2006 Plans:

- 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. Begin concept demonstration and effectiveness tests for high-payoff energetic concepts involving advanced energetic payloads. Develop and test at least two advanced formulations of high-energy survivable penetrator fills (Mach 1 to 4 impact velocities). Perform static tests of advanced payload concepts to quantify effects and target lethality and analyze results. Downselect novel Kinetic Energy (KE) gun propellant formulation.
- Initiate development and demonstration of promising non-energetic payloads for Hard and Deeply Buried Target Defeat.
- Continue weapon phenomenology testing. Conduct instrumented high-velocity test of jointed penetrator. Complete delivery of enhanced linear penetration model. Conduct thin-layer penetration tests and deliver improved model based on results. Complete validated vent attack model. Conduct high performance calculations to validate blast-door response models.
- Conduct static lethality demonstration of massive ordnance penetrator against hard and deeply buried targets. Conduct Massive Ordnance Penetrator scaled penetration and lethality testing. Conduct statically emplaced Proof-of Principle test on effectiveness of Massive Ordnance payloads. Conduct demonstration of massive ordnance air-blast lethality against a full-scale tunnel target. Start concept study of Precision Massive Ordnance Blast (PMOB) weapon.
- Demonstrate components of key BDI technologies for Enhanced Fuze Integrated BDI Demonstration (EFIBDID). Verify shock harness of weapon-borne Battle Damage Indicator (BDI) component.
- Complete detailed system design of the I-500 and conduct penetrator sled tests. Evaluate results of advanced energetic and non-energetic payload development tests and analyses. Initiate feasibility study of unique communications, navigation, mobility, survivability (passive and active), and explosives technology necessary for the use of ground-mobile munitions systems to attack tunnel complexes.
- Deliver Munitions Effects Assessment Version 7.0. Support Combatant Command (COCOM) Hard and Deeply Buried Target (HDBT) defeat planning with Targeting/Weaponing Assistance Cell (TWAC). Provided initial targeting recommendations to TWAC. Provided initial hard target defeat training sessions to warfighters.
- Complete construction and outfitting of tunnel facility testbed to support massive ordnance tests. Initiate construction of a testbed to support weapon-borne bomb damage information system tests. Design large-scale multistory building tests structure. Conduct multi-weapon egress denial demonstration.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BF - CP Operational Warfighter Support | |

FY 2007 Plans:

- Continue development of general purpose Enhanced Blast Explosives (EBX) and compare effectiveness in expanded target set conditions vs. conventional high explosives and the latest Thermobaric explosive (TBX). 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.
- Evaluate tunnel damage and in-tunnel effects of advanced weapon fills. Conduct small-scale tests of an optimized-multi-weapon attack against blast doors and develop a response model. Demonstrate optimized high-speed penetrator performance. Validate energy coupling model for massive ordnance.
- Conduct Massive Ordnance Penetrator Demonstration. Conduct full-scale Massive Ordnance Penetrator (MOP) performance demonstration against a realistic hard and deeply buried target. Conduct Precision Massive Ordnance Blast (PMOB) scaled static lethality tests.
- Conduct full scale Enhanced Fuze Integrated BDI Demonstration EFIBDID demonstrations. Demonstrate weapon sensors to facilitate bomb damage assessment (BDA) analysis.
- Initiate planning for a weapon-borne battle damage indicator system to be carried on existing hard target defeat weapon systems. Initiate feasibility study of the unique communications, navigation, mobility, survivability (passive and active), and explosives technology necessary for robotic systems to attack tunnel complexes.
- Begin transition of technology into improved lethality applications which support defeat of hardened facilities.
- Determine effectiveness of additional advanced weapon concepts and incorporate results into version 8.0 of Integrated Munitions Effects Assessment (IMEA). Provide 100 target weaponeering recommendations to Targeting/Weaponeering Assistance Cell (TWAC). Provide six hard target defeat training sessions to warfighters.
- Continue evaluations of other/additional weapon/sensor systems. Complete construction of the integrated demonstration testbed and begin the initial phase--find and characterize. Initiate construction of the internal tunnel defeat testbed. Conduct first large scale testing of weapons against bunkers under multi-story buildings.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Special Projects | 13.897 | 18.392 | 20.388 |

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BF - CP Operational Warfighter Support | |

FY 2005 Accomplishments:

- Continued Targeting and Intelligence Community Support. Delivered over 175 engineering characterizations and 800 3-D models of underground facilities to the warfighting commands and intelligence agencies to help them with targeting. Delivered software tools with enhanced special operations planning and target visualization functionality to help the warfighters and intelligence agencies plan the functional defeat of underground targets. Exercised with U.S. Special Operations Command and U.S. Strategic Command to assess the utility of our software tools and target characterization processes. Trained over 200 warfighters, intelligence analysts and technologists on basic and advanced underground target characterization techniques. Provided improved assessment on the geological characteristics of underground targets to the intelligence community.
- Continued Find, Characterize, Assess Technology Development. Collected signatures and associated data from DTRA hard target defeat testing and demonstrations and passed them to the intelligence community for incorporation into target databases. Demonstrated a prototype software tool to assist warfighters and intelligence analysts in the placement of sensors to gather data from underground targets. Improved and added more information to our database of worldwide underground facility construction technologies and capabilities for easier use by intelligence analysts in developing information on hard targets. Began initial systems engineering and integration planning for a new sensors system for the warfighters and intelligence community to gather signature data needed to characterize the physical layout and function of potential underground targets.

FY 2006 Plans:

- Continue Targeting and Intelligence Community Support. Develop, deliver, and integrate enhanced tools for analysis of target networks and planning special operations missions. Provide planning capabilities for our software tool users to facilitate more comprehensive target analysis. Conduct an exercise with the warfighters to assess the utility of our targeting tools and processes. Train over 200 warfighters and intelligence personnel on basic and advanced underground target characterization techniques.
- Continue Find, Characterize, Assess Technology Development. Begin development of a ground sensor system to improve underground facility (UGF) characterization and prompt bomb damage assessment. Expand and improve access to the target signatures and international construction technology data. Deliver improved geological property templates to intelligence analysts for improved targeting of underground facilities.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BF - CP Operational Warfighter Support | |

FY 2007 Plans:

- Continue Targeting and Intelligence Community Support. Begin integration of sensor systems data feeds into our software tools through existing command, control and communications systems to facilitate near-real-time target status assessment. Conduct an exercise with the warfighters to assess the utility of our targeting tools and processes. Train over 200 warfighters and intelligence personnel on basic and advanced underground target characterization techniques.
- Continue Find, Characterize, Assess Technology Development. Continue development of a ground sensor system to provide near-real-time data feed for enhanced underground facility (UGF) characterization and prompt bomb damage assessment. Expand and improve access to the target signatures and international construction technology data. Integrate geological characterizations into target assessment software to enhance utility and simplify underground target analysis.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BG – Nuclear Operations |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Project BG - Nuclear Operations | 72.482 | 10.819 | 17.018 | 17.672 | 17.716 | 19.924 | 21.756 |

A. Mission Description and Budget Item Justification:

The Nuclear Operations project conducts the research, development, test, and evaluation required to carry out the agency's specified and implied missions articulated in the National Military Strategy, the Nuclear Posture Review (NPR), the Quadrennial Defense Review (QDR), and those directed by the Joint Chiefs of Staff (JCS) in the Joint Strategic Capabilities Plan (JSCP) Nuclear Annex. It concurrently lays a foundation for potential transformation activities within the nuclear arena as identified in DoD's Transformation Planning Guidance (TPG).

This activity enhances deterrence and proactively supports the agency's mission of WMD threat reduction. The research and development is focused on adapting engineering and integrating current or new technologies into user -friendly instruments to meet the WMD threat. Initiatives supported by this project include, but are not limited to, such activities as follow:

- Integrating and applying new technological advances to improving capabilities for locating and detecting, and defeating and attributing, old and emerging WMD threats in both civilian and military areas. When possible or feasible, other government agencies' expertise or technologies are leveraged, most notably the Department of Energy and the Defense Nuclear Detection Office (DNDO).
- Conducting critical nuclear research, development, test and evaluation in support of the Combatant Commanders, Military Services, JCS and Office of the Secretary of Defense (OSD) through the oversight and response to the direction of the Nuclear Weapons Council.
- Aggressively assesses the continuously evolving CBRNE threat posed by old and new actors in the 21st Century.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---------------------------------------|---------|---------|---------|
| WMD (Nuclear) Protection and Response | 12.482 | 10.819 | 17.018 |

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BG – Nuclear Operations | |

FY 2005 Accomplishments:

- Completed the development of threat device models for the Domestic Nuclear Event Attribution (DNEA) Program's initial attribution capability; completed the initial development of an integrated materials and debris database; assisted the National Security Council (NSC) in developing and implementing a National Nuclear and Radiological Attribution Program Strategic Plan; performed debris analysis, evaluation and reporting exercises; completed the development of ground sampling robots for an initial capability.
- Delivered two laptops with the SENTRY and SNIPER databases. The SENTRY database collects nuclear threats world-wide for trending analysis. It also collects nuclear material/weapon transfers between countries and updated baseline information on facilities and areas that store, handle or produce materials/weapons. The SNIPER is a web-viewable, global nuclear weapons encyclopedia also used in contingency operations. Funding was also used to explore WMD events, data mining, and correlation analysis and expansion of forensics information.
- Developed/delivered two ruggedized, prototype backpack detectors (lanthanum halides radiation detectors) and performed initial operational test and evaluation. Additional test and evaluation is needed to incorporate this new detector material into an operational capability. Additionally, the Multiplatform System (MPS) was modified to add a wireless communication link.
- Congressional increase funding was applied to develop room temperature high pressure/high resolution xenon detector. The development will yield a room temperature detector that will eliminate the need for liquid nitrogen-thus reducing the current logistical burden. Prototype will be tested and delivered in FY 2006.

FY 2006 Plans:

- Participate in Joint Exercise Ardent Sentry 2006 (AS 06) to exercise the airlift of attribution assets and to integrate and coordinate DNEA radiological dispersal device (RDD) attribution operations with other response assets. AS 06 is an RDD event exercise, where the DTRA developed Domestic Nuclear Event Attribution (DNEA) capability will be used to ascertain its strengths and weaknesses when integrated into national, state and local WMD emergency activities.
- Conduct an engineering evaluation of a larger ground-debris collection platform with greater range and greater power capacity than the current DNEA initial integrated operational capability vehicle. Continue to explore other technologies that can enhance the rapid and effective collection of nuclear and radiological debris from the ground, air, water, and space.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602716BR Project BG – Nuclear Operations | |

- Conduct research to develop an analytical technology (other than exclusively radiochemistry) that can be used on the debris and signatures from a nuclear weapon event to accomplish the analysis of a nuclear detonation. The analysis will provide information, such as a device’s materials and design that is necessary to help attribute the event.
- Add three-dimensional display/graphic features to the SENTRY/SNIPER databases. Continue to populate databases.
- Continue to explore technologies that can improve and/or enhance rapid deployable radiation detection and tracking system Collaborate with other USG agencies such as the newly created Domestic Nuclear Detection Office (DNDO) to leverage their transformational research. Complete test and evaluation of the backpack prototypes delivered in FY 2005.
- Research and rapidly develop classified, unique (one or two items) technologies that directly aid the Warfighters in locating, identifying and defeating WMD devices.

FY 2007 Plans:

- Conduct the first flight of an Unmanned Aerospace Vehicle (UAV) air sampling system. The purpose of the UAV sampling system is to enhance personnel safety, increase the ability to respond rapidly and operate over areas that may be precluded to manned aircraft due to radiation levels, etc.
- Complete the engineering evaluation of the ground-debris collection platform that is larger has greater range, and greater power capacity than the current DNEA initial integrated operational capability vehicle. Continue to explore other technologies that can enhance the rapid and effective collection of nuclear and radiological debris from the ground, air, water, and space.
- Continue research to develop a more rapid analytical technology (other than exclusively radiochemistry) that can be used on the debris and signatures from a nuclear weapon event to accomplish the analysis of a nuclear detonation. The analysis will provide information, such as a device’s materials and design that is necessary to help attribute the event.
- Enhance/maintain the SENTRY/SNIPER databases to include three-dimensional capabilities. Continue to populate databases
- Deploy a Chemical Biological Radiological Nuclear Explosive (CBRNE)-detection system, integrated with satellite communication (reachback) and featuring enhanced analytical software.
- Research and rapidly develop classified, unique (one or two items) technologies that directly aid the Warfighters in locating, identifying, and defeating WMD devices. Annual Requirements are usually time-sensitive and tailored in scope.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602716BR Project BG – Nuclear Operations |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Classified Program* | 60.000 | 0.000 | 0.000 |

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

FY 2005 Accomplishments:

- Classified.

FY 2006 Plans:

- Classified.

FY 2007 Plans:

- Classified.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Department of Energy/Albuquerque Operations Office.

UNCLASSIFIED

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | R-1 ITEM NOMENCLATURE: WMD Defense Technologies; 0602717BR Re-titled FY 2005 from Strategic Defense Technologies | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Total 0602717BR Cost | 112.436 | 108.929 | 105.021 | 108.658 | 113.493 | 113.116 | 115.084 |
| Project BB Small Business Innovative Research* | 0.000 | 2.415 | 2.509 | 2.521 | 2.557 | 2.561 | 2.564 |
| Project BC Force Protection & Technology Applications | 1.498 | 1.806 | 1.679 | 1.713 | 1.751 | 1.752 | 1.755 |
| Project BG Nuclear Operations | 25.099 | 25.024 | 22.312 | 23.962 | 25.280 | 22.848 | 22.955 |
| Project BH System Survivability | 85.839 | 79.684 | 78.521 | 80.462 | 83.905 | 85.955 | 87.810 |

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

A. Mission Description and Budget Item Justification:

The mission of the Defense Threat Reduction Agency (DTRA) is to safeguard America and its allies from weapons of mass destruction (WMD) by reducing the present threat and preparing for the future threat. This mission directly reflects several national and DoD-level documents to include the National Security Strategy, Unified Command Plan (UCP), National Strategy to Combat WMD (NSPD-17), Counterproliferation Interdiction (NSPD-20), National Strategy for Combating Terrorism, National Military Strategy, Strategic Planning Guidance (SPG), Contingency Planning Guidance (CPG), National Military Strategy for Combating WMD, National Military Strategic Plan (NMSP) for the War on Terrorism (WOT), Joint Strategic Capabilities Plan (JSCP) (including the Nuclear Annex), Security Cooperation Guidance (SCG), Quadrennial Defense Review (QDR), Nuclear Posture Review (NPR), and Defense Transformation Planning Guidance (TPG). To achieve this mission, DTRA has identified principal objectives along with strategies and tasks to ensure the objectives are met. Three of these objectives are deter the use of WMD, reduce the present threat and prepare for the emergent future threat. A focused, strong threat reduction technology base is critical to achieving these objectives and is closely tied with the operational support programs that make up its combat support mission. DTRA has taken the steps to develop this technology base and provide a foundation for transformational activities within the WMD arena as delineated in the TPG.

This program element provides the essential technologies and operational support to deter the use of weapons of mass destruction and prepare for the projected WMD threat. It includes funding for assessments and development of strategies, concepts and strategic nuclear and WMD deterrence options. In addition, it provides funding for development and testing of special equipment, necessary facilities, and other

UNCLASSIFIED

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | R-1 ITEM NOMENCLATURE: WMD Defense Technologies; 0602717BR Re-titled FY 2005 from Strategic Defense Technologies | |

associated costs necessary for the development of the technology base needed to support the national deterrent policy and military strategy. Supported initiatives include, but are not limited to, the following development efforts:

- Programs focused on assessing, enhancing and maintaining the survivability and operability of nuclear deterrent forces.
- Operational support programs focused on activities such as balanced survivability assessments, operational assessments, nuclear physical security technology development, and assessments of various OPTEMPO concerns arising from chemical, biological, radiological, and nuclear environments.
- Support to the Office of the Secretary of Defense (OSD), JCS and Combatant Commands in war planning, force structure options, logistics, WMD mitigation operations and stockpile programs.
- Developing and validating advanced technology to provide enhanced WMD Training supporting Joint Mission Essential Tasks (JMETS) for forces and coordination of DoD WMD training requirements.
- Nuclear weapon effects survivability technology programs focus on:
 - Radiation hardened microelectronics technology that enables DoD space and missile systems to survive and operate in a space environment or in a nuclear radiation environment after a nuclear attack.
 - Simulator technology that enables simulation of the nuclear environments from a nuclear burst.
 - Assessments technology that develops design protocols, hardware, and software enhancing the ability of mission essential systems to survive a nuclear attack and to operate after a nuclear attack.
 - Detector technology that rapidly develops/converts radiation sensor, dosimetry and biological technologies for integration into real-time forward deployed tools for characterization of radiologically hazardous environments that impact warfighter mission and command and control decisions.

Nuclear sustainment technologies and projects support the viability and credibility of the nuclear force as well as development of nuclear environment survivability for the Integrated Ballistic Missile Defense System. The nuclear sustainment program, driven by the specific taskings of the National Security Strategy, National Military Strategy, the Nuclear Posture Review, and the Joint Strategic Capabilities Plan, has two projects, i.e., Nuclear Operations and System Survivability. Nuclear Operations develops and supports the National Nuclear Mission Management Plan; nuclear and WMD training expertise for the DoD; surety risk and hazard analyses; nuclear planning systems; nuclear deterrent option analyses; technical support for Nuclear Weapons Council (NWC) and nuclear Command, Control, Communications, Computers, and Intelligence (C4I) requirements; and WMD threat mitigation analyses.

R-1 Line Item No. 19

Page 2 of 26

UNCLASSIFIED

UNCLASSIFIED

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | R-1 ITEM NOMENCLATURE: WMD Defense Technologies; 0602717BR Re-titled FY 2005 from Strategic Defense Technologies | |

The System Survivability Project develops radiation hardened microelectronics to support DoD mission requirements for C4ISR assets, simulator technology to validate nuclear survivability requirements of military systems, assessments technology to model the response of critical national infrastructure after a nuclear weapon detonation, and nuclear detection and radiation dosimetry tools. It also provides technology to support the Congressional mandated Nuclear Test Personnel Review. These development areas directly support the development of survivable and reliable systems for the warfighter.

Nuclear Sustainment projects comprise a critical component of the ability of the Department to meet the technology and sustainment challenges posed by the emerging international environment and the National Military Strategy. The coverage of the projects ranges through countering WMD threats to the maintenance of the national strategic nuclear deterrent.

Operational support of the Combating WMD mission integrates support to the Joint Staff and OSD with support to the Combatant Commands. Support to the Joint Staff and OSD drives policy and doctrine development. Support to the Combatant Commanders turns policy into operational plans that are executable.

UNCLASSIFIED

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | R-1 ITEM NOMENCLATURE: WMD Defense Technologies; 0602717BR Re-titled FY 2005 from Strategic Defense Technologies |

B. Program Change Summary:

| (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|----------------------------------|---------|---------|---------|
| Previous President's Budget | 112.488 | 106.708 | 112.882 |
| Current President's Budget | 112.436 | 108.929 | 105.021 |
| Total Adjustment | -0.052 | 2.221 | -7.861 |
| Congressional program reductions | | | |
| Congressional reductions | | -1.579 | |
| Congressional increases | | 3.800 | |
| Reprogramming | | | |
| Classified Program Transfer | | | |
| Other Program Adjustments | -0.089 | | -7.861 |
| SBIR/STTR Transfer | 0.037 | | |

Change Summary Explanation:

- The decrease in the FY 2005 funding profile from the previous submission to the current President's Budget is the result of a Small Business Innovative Research (SBIR) funding transfer and a reduction to support the Department of Energy. During the year of execution, SBIR funding is consolidated into PE 0605502BR "Small Business Innovative Research" for execution.
- The decrease in FY 2006 from the previous submission to the current President's Budget is the result of the FY 2006 DoD Appropriation Act (P.L. 109-359) that contained several undistributed Congressional reductions that were proportionally applied to the entire DTRA RDT&E program. This program received a -\$1.579 million reduction. Additionally, this program received Congressional increases in the amount of \$3.800 million.
- The net decrease of \$7.861 million in FY 2007 from the previous submission to the current President's Budget reflects program reprioritization offset by an increase of \$1.619 million for non-pay purchase inflation. The decrease primarily reflects the realignment of funding within DTRA research and development resources to initiate a Basic Research program to support areas that are critical to

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | R-1 ITEM NOMENCLATURE: WMD Defense Technologies; 0602717BR Re-titled FY 2005 from Strategic Defense Technologies | |

the Department of Defense maintaining technological superiority. The decrease also reflects funding realignments in support of the Strategic Command (STRATCOM). DTRA's program priorities are linked to the Combatant Commanders.

- Funding is used to support high priority combat support requirements in accordance with current planning, assumptions and associated requirements, address critical infrastructure requirements and implement the business reform initiative. It also balances the program consistent with strategic priorities within DTRA and the DoD.
- 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; 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: Not Applicable.

E. Performance Metrics: Cost, schedule and performance are monitored via a combination of Earned Value Management System, Cost Schedule Status Reporting, and Cost Funds Status Reports.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602717BR Project BB – Small Business Innovative Research |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|--|---------|---------|---------|---------|---------|---------|---------|
| Project BB - Small Business Innovative Research* | 0.000 | 2.415 | 2.509 | 2.521 | 2.557 | 2.561 | 2.564 |

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

A. Mission Description and Budget Item Justification:

To prepare for critical future WMD mitigation technology needs, WMD related advanced technology programs will invest in a balanced program of high leverage technologies that will yield improved WMD capabilities across a broad range of WMD defeat, WMD Defense, and an innovative science and technology programs. DTRA maintains a specific effort with minority and disadvantaged business; to include Historically Black Colleges and Universities/Minority Institutions and businesses. Each program and investment will focus, to the maximum extent feasible, on innovative WMD related technologies in support of future WMD mitigation capabilities. An important goal of each effort is to identify, develop, and demonstrate WMD related innovative technologies which will dramatically improve WMD Defense and Defeat performance.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|------------------------------------|---------|---------|---------|
| Small Business Innovative Research | 0.000 | 2.415 | 2.509 |

FY 2005 Accomplishments:

- Not Applicable.

FY 2006 Plans:

- Fund 45.4 percent of DTRA SBIR investment including:
 - Up to ten Phase I SBIR contracts from proposals from FY 2006 topic areas including WMD Dispersal Device Defeat, Advanced X-ray Simulator; Next Generation Blast Mitigation, Weapons of Mass Destruction (WMD) Hazard Modeling and Simulation, Integrated WMD Toolset Near Real Time Response, Chemical/Biological Agent Deny and Defeat, Enhanced Deep Earth Penetration Capability, and Energetic Materials and Weapon Concepts.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BB – Small Business Innovative Research | |

- Up to two Phase II SBIR contracts to perform full research and development on promising FY 2005 Phase I efforts.
- Share of incremental funding of FY 2005 Phase I and FY 2004 Phase II SBIR contract awards.

FY 2007 Plans:

- Fund 44.7 percent of DTRA SBIR investment including:
 - Up to ten Phase I SBIR contracts to perform feasibility studies on FY 2007 topics.
 - Up to two Phase II SBIR contracts to perform full research and development on promising FY 2006 Phase I efforts.
 - Share of incremental funding of FY 2006 Phase I and FY 2005 Phase II SBIR contract awards.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BC– Force Protection & Technology Applications | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---------|---------|---------|---------|---------|---------|---------|
| Project BC - Force Protection & Technology Applications | 1.498 | 1.806 | 1.679 | 1.713 | 1.751 | 1.752 | 1.755 |

A. Mission Description and Budget Item Justification:

This project develops assessment and mitigation technologies to conduct integrated, multi-discipline assessments of critical national/theater mission systems leading to the development of investment strategies for improved survivability. This project also ensures that assessment training programs, engineering designs, and new construction embody sound force protection, vulnerability mitigation, and collective protection principles. Some of the project's products and services include:

- Balanced Survivability Assessments (BSA)
- Vulnerability out-briefs and written reports
- Overall vulnerability trend data
- Multi-disciplined technical engineering expertise support

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|------------------------------------|---------|---------|---------|
| Balanced Survivability Assessments | 1.498 | 1.806 | 1.679 |

FY 2005 Accomplishments:

- Conducted balanced survivability and integrated vulnerability assessments of DoD facilities and systems as tasked by OSD, Combatant Commands, and the Joint Staff. Conducted balanced vulnerability assessment of defense and critical national infrastructure facilities and systems. Conducted architectural analyses to determine systemic vulnerabilities.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BC– Force Protection & Technology Applications | |

FY 2006 Plans:

- Conduct balanced survivability and integrated, multi-discipline assessments of critical national/theater mission systems as tasked by OSD, Combatant Commands, and the Joint Staff. Conduct balanced vulnerability assessment of defense and critical national infrastructure facilities and systems. Conduct architectural analyses to determine systemic vulnerabilities.

FY 2007 Plans:

- Conduct balanced survivability and integrated, multi-discipline assessments of critical national/theater mission systems as tasked by OSD, Combatant Commands, and the Joint Staff. Conduct balanced vulnerability assessment of defense and critical national infrastructure facilities and systems. Conduct architectural analyses to determine systemic vulnerabilities.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602717BR Project BG – Nuclear Operations |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Project BG - Nuclear Operations | 25.099 | 25.024 | 22.312 | 23.962 | 25.280 | 22.848 | 22.955 |

A. Mission Description and Budget Item Justification:

These programs directly support the National Military Strategy, including the dictates of the Nuclear Posture Review (NPR), and are directed by the JCS in the Joint Strategic Capabilities Plan (JSCP) Nuclear Annex. This project for this Program Element encompasses two activities:

- Nuclear Programs.
- Combating WMD Support.

These programs are responsive to the oversight of the Nuclear Weapons Council and they provide critical support to the Combatant Commands, Services, JCS and OSD.

Nuclear Programs.

- Nuclear Weapons Surety:
 - As tasked by the DoD Nuclear Weapon System Safety Program, the surety programs provide Combatant Commands, Services, and JCS with technical analyses, studies, research, and experimental data necessary to identify and quantify risks of plutonium dispersal and Loss of Assured Safety (LOAS) due to accidents, fires or natural causes during peacetime operations of the nations nuclear weapon systems. Additionally, these programs will provide studies necessary to quantify the probability of success against targeted terrorist attacks on DoD facilities, while leveraging these risk assessment advances.
 - MIGHTY GUARDIAN Force-on-Force evaluations aid in satisfying requirements for the Air Force and Navy of providing absolute denial of access to nuclear weapons in all environments, from storage to transit. The results of the evaluations identify security vulnerabilities to weapons systems in various environments. The Air Force and Navy identify projects that require research and development to demonstrate, test, and evaluate systems prior to Service procurement to successfully plan and conduct force-on-force evaluations and associated engineering studies that accurately evaluate the adequacy of DoD, Service, and Combatant Command nuclear security policies.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BG – Nuclear Operations | |

- Physical security projects in support of Combatant Commands and Services, new and innovative technologies are developed for the protection of nuclear resources. Following proof-of-concept, these projects are transitioned to the Services for advanced development, procurement, and fielding.
- Stockpile Sustainment. As tasked, continue to operate as the Department of Defense Executive Agent for Annual Certification support related stewardship and sustainment activities. Provide support to senior program managers and decision makers concerning issues associated with maintaining and improving the aging stockpile; senior level committees that identify and develop programs to improve the reliability and sustainability of the nuclear stockpile; and an outreach program to educate DoD planners and managers about issues associated with sustaining the nuclear stockpile.
- Stockpile Operations Support: In support of national requirements necessary to maintain a viable nuclear deterrent, the Defense Integration and Management of Nuclear Data Services (DIAMONDS) and the Nuclear Management Information System (NUMIS) provides automated tools which enable users to maintain, report, track and highlight trends affecting the nuclear weapon stockpile activities ensuring continued sustainability and viability of the nuclear stockpile.

Combating WMD Support.

- Provide comprehensive combating WMD support to the DoD, as tasked by the Strategic Planning Guidance, the Contingency Planning Guidance, the Joint Strategic Capabilities Plan (JSCP), and other directing documents. Combating WMD encompasses all three pillars of the National Strategy – Nonproliferation, Counterproliferation, and Consequence Management and the eight mission areas – treaties and agreements, threat control and reduction, WMD interdiction, WMD elimination, offensive operations, active defense, passive defense, and consequence management. Support to the DoD includes direct support to the Combatant Commands, Services, Joint Staff, and OSD.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Nuclear Programs | 18.094 | 18.049 | 17.935 |

FY 2005 Accomplishments:

- Nuclear Weapon Surety Thrusts:

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BG – Nuclear Operations | |

- Continued Weapon storage facility modeling and testing safety requirements and criteria. Developed and populated the Nuclear Surety Information Center database to utilize and archive completed assessments, studies, tools, and test programs. Improved evaluation of enduring stockpile weapons in support of the U.S. Air Force and U.S. Navy.
- Conducted a Mighty Guardian Force-on-Force test of off-base convoy forces at Camp Guernsey, WY. Enhanced exploratory research on physical security equipment and technology designed to increase protection of the nuclear stockpile.
- Improved nuclear storage facility fire suppression capabilities based on Fire Hazard Analysis results and new technology.
- Began analyses of abnormal environmental scenarios for nuclear weapons systems.
- Stockpile Sustainment Program thrusts:
 - Provided support to the Threat Reduction Advisory Committee and other high level committees that identify and develop programs to improve the reliability and sustainability of the nuclear stockpile.
 - Supported annual certification and stockpile stewardship for continued safety and reliability of U.S. nuclear stockpile in the absence of underground testing.
 - Developed and improved the "Nuclear Deterrent Support Program" into a more robust "Nuclear Deterrent and WMD Support Program", with new initiatives under all the Combating WMD Pillars (Non-Proliferation, Counterproliferation, and Consequence Management).
 - Continued enhanced technical support to the Nuclear Weapons Council (NWC) and Joint Advisory Committee (JAC); supported development of the Nuclear Weapons Stockpile Plan and the Requirements and Planning Document and other annual high-level nuclear stockpile reports.
 - Improved the development and presentation of tailored nuclear weapons expertise and sustainment education modules through expanded outreach efforts to the War Colleges, Service Academies, and operational units.
- Stockpile Operations thrusts:
 - Provided national nuclear weapon reporting and tracking systems in peacetime, crisis, and wartime and ensure DoD's capability to rapidly verify continued custody of all nuclear weapons while sustaining, maintaining and improving the capabilities of the Defense Integration and Management of Nuclear Data Services (DIAMONDS) worldwide. Fielded remaining Air Force OCONUS sites with Defense Integration and Management of Nuclear Data Services (DIAMONDS) hardware and software. Began software development of DIAMONDS for Navy nuclear weapon custodial sites and completed initial migration of Nuclear Management Information System (NUMIS) database architecture into DIAMONDS.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BG – Nuclear Operations | |

FY 2006 Plans:

- Nuclear Weapon Surety Thrusts:
 - Conduct hazard analysis research and development of nuclear weapon fire involvement modeling simulations for the Air Force for use in the Integrated Weapons of Mass Destruction Tool Kit (IWMDT) and Nuclear Capabilities Services (NUCS). Conduct fire prevention and suppression hardware development, and fact finding for the production of a Uniform Facility Criteria for DoD nuclear weapon capable storage and maintenance buildings. These efforts are responsive to the DoD Directive and Manual on Nuclear Weapons Systems Safety (DoDD 3150.2). Continuing efforts involve modeling and testing necessary to respond to weapon storage facility and weapon system safety requirements and criteria.
 - Mighty Guardian IX in March 2006 will conduct Force-On-Force test at Whiteman Air Force Base, MO to evaluate nuclear security policy as it applies to Weapons Storage Areas. Additionally, execute one out-of-cycle test to determine delay times and breaching methods for security systems at underground nuclear storage areas to support Mighty Guardian X scheduled for execution in FY 2007.
 - Conduct exploratory research on physical security equipment and technology designed to enhance protection of the nuclear stockpile.
- Stockpile Sustainment Program thrusts:
 - Continue to provide support to DoD senior leadership and decision makers concerning issues associated with nuclear stockpile and improvements associated with specific weapons systems. This includes support to the Threat Reduction Advisory Committee and other high level committees that identify and develop programs to improve the reliability and sustainability of the nuclear stockpile. Continue to provide an outreach program, which educates planners and managers about the nuclear stockpile.
- Stockpile Operations thrusts:
 - Defense Integration and Management of Nuclear Data Services (DIAMONDS): Efforts this year include initiating the redesign of the reporting and fielding system at all Naval sites; initiating the planning phase for the Decision Support Module for DIAMONDS and integrating the Nuclear Management Integration System (NUMIS) into the existing DIAMONDS architecture.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BG – Nuclear Operations | |

FY 2007 Plans:

- Nuclear Weapon Surety Thrusts:
 - Continue hazard analysis research and development of nuclear weapon fire involvement modeling simulations for the Air Force for use in the Integrated Weapons of Mass Destruction Tool Kit (IWMDT) and Nuclear Capabilities Services (NUCS). Conduct fire prevention and suppression hardware development, and fact finding for the production of a Uniform Facility Criteria for DoD nuclear weapon capable storage and maintenance buildings. These efforts are responsive to the DoD Directive and Manual on Nuclear Weapons Systems Safety (DoDD 3150.2). Continuing efforts involve modeling and testing necessary to respond to weapon storage facility and weapon system safety requirements and criteria.
 - Mighty Guardian X in March 2007 will conduct Force-On-Force test at Kirtland Air Force Base, NM to evaluate nuclear security policy as it applies to Underground Storage Areas. Additionally, Mighty Guardian XI in September 2007 will conduct Force-On-Force test in the Air Force Space Command’s missile fields to evaluate nuclear security policy as it applies to missile silos. Conduct exploratory research on physical security equipment and technology to enhance protection of the nuclear stockpile as determined by the Services.
- Stockpile Sustainment Program thrusts:
 - Continue to provide support to senior program managers and decision makers concerning issues associated with nuclear stockpile and improvements associated with specific weapons systems. This includes support to the Threat Reduction Advisory Committee and other high level committees that identify and develop programs to improve the reliability and sustainability of the nuclear stockpile. Continue to provide an outreach program, which educates planners and managers about the nuclear stockpile.
- Stockpile Operations thrusts:
 - Defense Integration and Management of Nuclear Data Services (DIAMONDS): To continue providing nuclear reporting and tracking systems, stockpile information and Joint Nuclear Weapons Publications to the nuclear weapon community. Continued progress and emphasis includes, planning and preliminary design of advanced/interactive Joint Nuclear Weapons Publication System (JNWPS) in DIAMONDS; completion of DIAMONDS fielding at Naval sites not previously fielded; continuation and completion of Decision Support Module development for DIAMONDS, and the completion of the redesign of the DIAMONDS reporting system.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BG – Nuclear Operations | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Combating WMD Support | 7.005 | 6.975 | 4.377 |

Retitled in FY 2005 from Combatant Commands/Forces/Security Support

FY 2005 Accomplishments:

- Enhanced European Theater Nuclear Support Program to provide in-theater nuclear and WMD support to EUCOM, NATO, and SHAPE.
- Restructured support to Commander, USSTRATCOM to conduct strategic and operational level planning with OSD, Joint Staff, and other Combatant Commands, as well as develop global WMD situational awareness and an interagency coordination and requirements assessment capability. Restructured internal planning within DTRA to continue to develop Agency contingency and support plans in support of the Combatant Commands combating WMD plans. Supported the initial development of the National Military Strategy for Combating WMD for Joint Staff and OSD that will provide a strategic framework to dissuade, deter and defeat potential adversaries' use of WMD against the U.S., its forces, allies and friends.

FY 2006 Plans:

- Restructure the European Theater Nuclear Support Program to provide improved in-theater nuclear and WMD support to EUCOM, NATO, and SHAPE.
- Complete the development of the DoD CONPLAN for combating WMD for USSTRATCOM. Develop Combating WMD policy/doctrine capability to provide support to Joint Staff and OSD over the full range of WMD issues. Complete the development of a combating WMD planning capability to support the Combatant Commands by rapidly responding to requests to address Combating WMD challenges within theater war plans, and by supporting Contingency Planning Guidance taskings. Complete development of DTRA support plans capability to the COCOMs and for DTRA contingency plans.

FY 2007 Plans:

- Complete restructuring of the European Theater Nuclear Support Program to provide improved in-theater nuclear and WMD support to EUCOM, NATO, and SHAPE.
- Enhance and sustain DTRA support plans capability to the COCOMs and for DTRA contingency plans

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BG – Nuclear Operations | |

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Science Applications International Corporation (SAIC) and Northrop Grumman.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BH – System Survivability | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|-----------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Project BH - System Survivability | 85.839 | 79.684 | 78.521 | 80.462 | 83.905 | 85.955 | 87.810 |

A. Mission Description and Budget Item Justification:

These activities directly reflect the National Military Strategy, supporting the provisions of the Nuclear Posture Review. Current and future warfighters and weapon systems, including the associated Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR), missile defense and support systems/equipment, must be able to survive and operate effectively through a spectrum of hostile environments. Planned efforts emphasize the development and demonstration of innovative and cost-effective technologies to sustain the functional survivability of U.S. and Allied Forces and systems when confronted with threats from advanced conventional weapons, special weapons and limited nuclear attack.

This project constitutes the DoD’s resident science and technology expertise in nuclear and related survivability matters. It develops and demonstrates affordable strategies and hardening technologies for U.S. systems and forces; transfers the technical products to acquisition program offices; conducts component, subsystem, system and end-to-end performance tests and assessments as requested by the Services and Combatant Commands; and provides support to the Office of the Secretary of Defense on technical and policy matters that relate to the acquisition of survivable systems and strategic system sustainment.

This project encompasses activities divided into four business areas as described below: Radiation Hardened Microelectronics, Simulation Technology, Assessment Technology and Radiation Detection Technologies.

The Radiation Hardened Microelectronics area responds to DoD space and missile system requirements for radiation-hardened microelectronics and photonics technology to support mission needs. The non-availability of this technology would adversely impact system survivability, performance, weight and cost. This program develops and demonstrates radiation-hard, high performance prototype microelectronics to support the availability of radiation-hardened microelectronics and photonics for DoD missions from both private sector and government organizations. The Accelerated Technology Development Program established the capability to fabricate radiation hardened 150 nanometer Complementary

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BH – System Survivability | |

Metal Oxide Semiconductor (CMOS) technology at two domestic radiation hardened semiconductor suppliers, BAE SYSTEMS and Honeywell Defense Space and Electronic Systems (DSES).

The Simulation Technology area maintains test capability to produce a radiation environment similar to that of a nuclear detonation. These nuclear weapons effects (NWE) simulators are used to validate nuclear survivability requirements for DoD missile and space systems, conduct research in radiation effects, and validate computational models. Since the underground testing (UGT) moratorium, above ground simulators have provided the only means to provide realistic, cost effective nuclear test environments. The NWE simulators are used by the Defense Agencies, the Services and other federal departments (such as DOE) to evaluate the impact of nuclear environments on their respective systems. As military systems and concepts evolve, especially in the area of electronics, optics, sensors, and guidance systems, parallel changes in simulator technology are required, e.g., survivable optical components for missile defense and micro-electromechanical systems require unique radiation test environments. DTRA has a joint collaboration with DOE to maintain a minimum suite of simulators to support system survivability testing and stockpile stewardship requirements.

The Assessments Technology focuses on ensuring that critical national systems (infrastructures, facilities, and command and control systems) can survive and operate in the event of a nuclear weapon detonation, and it provides nuclear and radiological modeling and simulation predictions for use by decision makers. It provides products and assistance to system program offices, agencies, the services, combatant commanders and the National Command Authority. It develops tools that assess the vulnerabilities of mission essential infrastructure, nuclear missile interceptors, strategic radar systems, strategic command and control networks, computers, sensors, satellites, and other critical warfighting systems. This activity provides nuclear electromagnetic pulse technical expertise to assist DoD in ensuring the Nation’s Nuclear Command and Control System and other mission essential systems can operate in a nuclear electromagnetic pulse environment. The activity also provides DoD’s nuclear design and protection standards to ensure new and existing systems (e.g. command and control facilities and aircraft) are designed and built to survive and operate in nuclear environments.

Detection Technologies develops or exploits radiation sensor, dosimetry and biological technologies and integrates them into real-time, forward-deployed tools for characterizing radiologically hazardous environments. Its products protect the health and welfare of U.S. service personnel and allied forces by monitoring human survivability during operations on the radiological/WMD battlefield or in areas of suspected WMD development or release. Lessons learned from the Nuclear Test Personnel Review Program (O&M-funded) will allow warfighters and

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peacekeepers to quantify and mitigate the risk in radiological settings (i.e., limited nuclear exchanges, terrorist actions, radiological dispersal weapons, and other radiation risk scenarios).

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|--|---------|---------|---------|
| Radiation Hardened (RH) Microelectronics | 58.399 | 37.373 | 38.039 |

FY 2005 Accomplishments:

- Completed RH Microelectronics (RHM) Accelerated Technology Demonstration (ATD) of RH 150nm bulk silicon and silicon-on-insulator (SOI) technologies. ATD technology resulted in a decrease in power by a factor of 12, performance increase by a factor of 5 and density increase by a factor of 20. This advanced technology is available for systems such as Trident D5 Life Extension, Transformational Satellite Communications (TSAT), and Space Based Radar (SBR).
- Demonstrated RH Electronic Design Automation (EDA) 250nm design capability to support the design of complex hardened digital and Analog/Mixed-Signal (A/M-S) circuits.
- Completed demonstration of RH 250nm A/M-S technology required for systems with very high onboard data and signal processing requirements.
- Developed very high speed (1 GHz) electronics radiation test capability needed to validate complex, high performance payloads.

FY 2006 Plans:

- Demonstrate radiation hardened (RH) 150nm bulk silicon and silicon-on-insulator prototype integrated circuits and develop next generation RH 90nm test structures to support radiation effects characterization.
- Demonstrate RH EDA 150nm design capability for digital technology.
- Demonstrate RH 250nm Read Out Integrated Circuit (ROIC) to support Space Surveillance and Tracking System (STSS) and other national asset systems. Demonstrate RH 150nm A/M-S technology for systems with ultra-high onboard data processing requirements for advanced throughput and functionality.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BH – System Survivability | |

- Demonstrate very high speed (1 GHz) electronics radiation test capability. Evaluate advanced semiconductor structures, designs, layout and fabrication methods and materials to support nuclear hardening and survivability.

FY 2007 Plans:

- Demonstrate radiation hardened 150nm bulk silicon and SOI technologies in the following integrated circuits: 16M Static Random Access Memory (SRAM), structured Application Specific Integrated Circuit (ASIC), and 250Kgate Field Programmable Gate Array (FPGA). These devices will support systems that include TSAT, SBR and other National C4ISR space assets. Demonstrate innovative radiation hardening methods for 90nm technology.
- Demonstrate RH EDA 150nm design capability for combined digital and A/M-S technologies to support complex integrated circuit designs for STSS, TSAT, and other National C4ISR space assets.
- Demonstrate RH 150nm A/M-S prototype integrated circuits with power, speed and reliability performance improvements over state-of-the-art single chip device capabilities to support a wide range of military assets with complex electronic payloads that must operate in a nuclear environment.
- Develop and validate radiation testing protocols to support characterization of very high speed electronics.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Simulation Technology | 12.149 | 22.574 | 21.276 |

FY 2005 Accomplishments:

- Simulator Technology Research and Development. Completed radiation source research on the Decade Simulator by demonstrating a three-fold increase in generation of X-rays on Decade for testing survivability of optical sensor systems (i.e., mirrors, cameras, satellite windows that hold cameras, telescopes in space, etc.). Obtained engineering data for design of Modular Debris Mitigation System (MDMS). Budget limitations made it necessary to cease operations of the Decade simulator at Arnold Engineering Development Center, Tullahoma, Tennessee. Continued testing and analysis for cold and warm X-ray sources necessary for testing survivability of optics, sensors, guidance and electronic systems and identified new approaches for improved testing. Demonstrated proof of concept energy storage technology that will greatly reduce size and complexity of NWE simulators. Initiated Joint Nuclear Simulator Working Group (JNSWG) with Sandia National Laboratories (SNL) to foster DTRA

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and DOE technical collaboration in areas of nuclear weapon simulator technologies, and to avoid overlap in capabilities and maximize efficiency of existing infrastructure.

- **NWE Test Capabilities.** Maintained DoD Nuclear Weapons Effects test capability in support of DoD and DOE research and test requirements. DTRA's Nuclear Weapons Effects simulators consist of a suite of four simulators – Double-EAGLE, PITHON, Pulserad 1150 and Modular Bremsstrahlung Source (MBS) – located at the West Coast Facility (WCF) in San Leandro, California. Completed 223 test days on the WCF simulators. Implemented improvements/repairs in hot X-ray, data acquisition systems and diagnostics to support customer test requirements. Implemented 30% improvement in generation of X-rays for testing survivability of electronic systems (i.e., military communication equipment, control boxes/ data cables inside a missile, computers, power supplies, power generators, etc.) in a nuclear environment.

FY 2006 Plans:

- **Simulator Technology Research and Development.** Building on FY 2005 results, demonstrate a 20% increase in generation of X-ray energy/unit area at WCF for testing optical sensor system survivability. Perform continued testing and analysis for achieving the (5-year) goal of a 2-fold increase in X-rays with a factor-of-two improvement in pulse width for electronics testing. Demonstrate 150% improvement in output of compact primary energy storage technology. Continue DoD and DOE collaborations via the JNSWG. Working through the Joint Nuclear Simulator Working Group (JNSWG), conduct experiments on SNL's Saturn simulator with the goal of achieving a 2-fold increase in Saturn's capability to produce X-rays for optical system survivability testing.
- **NWE Test Capabilities.** At WCF, implement 50% improvement in generation of X-ray-s energy/unit area for testing electronic systems. Continue necessary improvements/repairs for hot X-ray capability and data acquisition to support customer requirements. Continue to maintain WCF test capability for DoD and DOE system developers. Scheduled users include: the Trident Nuclear Missile system, Air Force ICBMs, Advanced Extremely High Frequency (AEHF) Satellite system, Space Based Infrared Radiation (SBIR) Satellite system, and DOE Sandia National Laboratories (SNL) stockpile stewardship programs. Conduct planned 296 total test days on four WCF simulators.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BH – System Survivability | |

FY 2007 Plans:

- Continue testing and analysis for achieving the (5-year) goal of a 2-fold increase in X-rays with a factor-of-two improvement in pulse width for electronics testing at the WCF. Transition innovative high spectral fidelity X-ray source technology and diagnostics to improve nuclear weapons effects simulation and model validation. Continue DoD and DOE collaborations via the JNSWG. Working through the JNSWG, conduct experiments on SNL’s Saturn simulator to demonstrate a 2-fold increase in Saturn’s capability to produce X-rays for optical system survivability testing and develop an associated Modular Debris Mitigation System. Building on this and other previous work, plan experiment on SNL’s ZR to achieve a 2-fold increase in X-rays over Z for optical system survivability testing.
- Continue to maintain simulators and improve test capability to support long term testing by DoD and DOE system developers. Improve operational efficiency by introducing new technologies. Continue pulsed power improvements/repairs to Double Eagle and complete improvements/repairs for DAS and hot X-ray capability. Planned users include: the Trident Nuclear Missile system testing, Advanced Extremely High Frequency (AEHF) Satellite system testing, Space Based Infrared Radiation (SBIR) Satellite system tests, and other DoD and DOE systems developers

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|------------------------|---------|---------|---------|
| Assessments Technology | 14.478 | 16.907 | 18.085 |

FY 2005 Accomplishments:

- Initiated Missile Defense Radar simulator development to provide a means to verify that the defense radar system can operate in a nuclear weapon environment. Transitioned this sub-activity to Simulation Technologies within System Survivability.
- Provided nuclear electromagnetic pulse hardening and survivability support to key Missile Defense facilities in Alaska and the Nuclear Command and Control System to ensure the United States Missile Defense System and the Nuclear Command and Control System can operate in nuclear environments. Facilities included the Pentagon’s National Military Command Center and the power system and satellite terminal in Alaska.
- Initiated develop of modern, net-centric nuclear weapon effects modeling and simulation capabilities supporting combatant commands and defense agencies. Capabilities, integrated from over 70 legacy codes, include all nuclear and radiological

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BH – System Survivability | |

modeling and simulation for nuclear targeting, consequence assessments, predicting effects on key systems, critical military system survivability designs, and battle simulations. Began developing a joint U.S. and United Kingdom modeling and simulation accreditation process to ensure Department of Defense verification, validation, and accreditation standards are met.

FY 2006 Plans:

- Continue to provide nuclear electromagnetic pulse (EMP) hardening and survivability support to the Joint Staff, Defense Information Systems Agency (DISA), and the Missile Defense Agency (MDA). Planned locations include Fort Greely, Alaska and Cheyenne Mountain Air Station Complex. Assist DoD in developing electromagnetic pulse survivability standards, criteria, and response to the EMP Commission. Develop an automated, remote capability to perform electromagnetic hardness maintenance/surveillance for Missile Defense communications networks ensuring systems remain protected against EMP. Develop affordable test techniques to verify electromagnetic protection against EMP for critical infrastructure and facilities. Coordinate with DISA to identify and harden the future net-centric Nuclear Command and Control System based on DoD's communication architecture.
- Continue developing the modern, net-centric nuclear weapon effects modeling and simulation capabilities supporting combatant commands and defense agencies. Finalize developing and implement the joint US and United Kingdom modeling and simulation accreditation process begun in FY 2005.
- Conduct nuclear height of burst analysis for US Pacific Command forces supporting their contingency planning operations and support/conduct Ballistic Missile Defense System (BMDS) nuclear weapon effect survivability assessments to assist in verifying BMDS systems can survive and operate in nuclear weapon effect environments.
- Initiate a three year effort to improve the electromagnetic pulse modeling and prediction capabilities on DoD and civilian infrastructure and systems. This effort includes verifying and validating data and applying new methods (statistical approach) to predict how systems respond to electromagnetic pulses.

FY 2007 Plans:

- Continue to provide nuclear electromagnetic hardening and survivability support to the Joint Staff, DISA, and MDA. Planned locations include Fort Greely, Alaska and Cheyenne Mountain Air Station Complex. Assist DoD in developing electromagnetic pulse (EMP) survivability standards, criteria, and response to the EMP Commission. Develop an automated, remote capability to

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | | PROJECT NAME AND NUMBER: 0602717BR Project BH – System Survivability |

perform electromagnetic hardness maintenance/surveillance for Missile Defense communications networks ensuring systems remain protected against electromagnetic pulses. Develop affordable test techniques to verify electromagnetic protection against EMP for critical infrastructure and facilities.

- Continue the three year effort to improve the EMP modeling and prediction capabilities on DoD and civilian infrastructure and systems. This effort includes verifying and validating data and applying new methods (statistical approach) to predict how systems respond to electromagnetic pulses.
- Provide the initial operating capability for the modern, net-centric nuclear weapon effects modeling and simulation capabilities supporting combatant commands and defense agencies. The initial phase will include selected capabilities, integrated from over 70 legacy codes, for nuclear and radiological modeling and simulation for nuclear targeting, consequence assessments, predicting effects on key systems, critical military system survivability designs, and battle simulations. Accredited all modeling capabilities through the joint US and United Kingdom process. Begin developing the concept for four dimensional (3D plus time) nuclear weapon effects modeling and simulation to provide decision makers state of the art visual predictions to assist in wargaming and weapon effect predictions.
- Support/conduct Ballistic Missile Defense System (BMDS) nuclear weapon effect survivability assessments to assist in verifying BMDS systems can survive and operate in nuclear weapon effect environments.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-------------------------|---------|---------|---------|
| Detection Technologies* | 0.813 | 2.830 | 1.121 |

* Retitled to Detection Technologies in FY 2005 (Previously titled: Human Survivability).

FY 2005 Accomplishments:

- Completed first phase radiation biodosimetry effort (successful laboratory exposure monitoring) and initiated second phase (integrated field prototype) development. This blood microassay will allow field assessment of radiation exposure immediately following a radiological event.
- Initiated low cost individual dosimeter development efforts to achieve next generation individual warfighter dosimeters. When completed, these dosimeters will allow remote monitoring and recording of radiation exposure data.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BH – System Survivability | |

- Transitioned aerial radiation hazard mapping system development to PE 0603160BR, Project BI for advanced system development following proof-of-principle demonstration. This effort provides the basis for a FY 2006 Joint/Advanced Concept Demonstration in combination with Project BI results.

FY 2006 Plans:

- Initiate focused effort to develop an in situ Electron Paramagnetic Resonance (EPR) tool to measure lifetime radiation exposure from teeth non-destructively. The EPR assay provides lifetime while blood dosimetry provides recent exposure leading to a long term intrinsic record.
- Complete second phase (integrated field prototype) development of a radiation biodosimeter to assay individual radiation exposure after a radiological event. Testing of this field prototype is scheduled to initiate in FY 2007 but will require extensive utilization of voluntary human exposure tests. On completion and validation of results, this system will transition to the DoD medical community.
- Continue low cost individual dosimeter development efforts to achieve next generation individual warfighter dosimeters. These efforts will include second phase developments of promising approaches.
- Initiate efforts to develop a portable mercuric iodide-based gamma-ray sensitive imaging instrument for portable scanning of suspicious containers by troops in the field. This effort is initiated under a Congressional Adjustment titled: “Advanced Portable Mercuric Iodine Imaging Technology for Chemical, Biological, Radiological Nuclear and Explosive (CBRNE) Special Operations”.

FY 2007 Plans:

- Continue a focused effort to develop an in situ Electron Paramagnetic Resonance (EPR) tool to measure lifetime radiation exposure from teeth non-destructively. This effort is scheduled to produce a testable prototype in FY 2008.
- Initiate extensive human trials of the integrated field prototype radiation biodosimeter to assay radiation exposure of individuals post radiological-event with the goal of ensuring that the blood microassay is consistent over the full human population. On completion and validation of results, this system will transition to the DoD medical community.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 | PROJECT NAME AND NUMBER: 0602717BR Project BH – System Survivability | |

- Complete spiral one development of low cost individual dosimeters to achieve the next generation of individual warfighter dosimeters. Spiral two development will increase integration and ensure that all systems are compatible with DoD battlefield communications standards.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Jointly develop with other DoD organizations and DOE an optimum set of simulators and supporting technology. Operational support for the DTRA West Coast Facilities and for R&D will be procured from industry. Limited competition may be utilized due to the lack of qualified companies and expertise required. Specialized R&D, test and analytical expertise will be obtained from the Naval Research Laboratory and Sandia National Laboratories (Simulation Technology).

E. Major Performers:

- **Radiation Hardened Microelectronics.** BAE Systems, Honeywell Inc.
- **Simulation Technology.** L-3 communications Pulse Sciences Division, Naval Research Laboratory, Alameda Applied Sciences Corporation, Sandia National Labs.
- **Assessments Technology.** SAIC, ARA, L3/Titan, and MRC.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | | R-1 ITEM NOMENCLATURE: Proliferation Prevention and Defeat; 0603160BR |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|--|---------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Total 0603160BR Cost | 89.839 | 107.879 | 104.582 | 109.371 | 109.906 | 111.593 | 113.503 |
| Project BB - Small Business Innovative Research* | 0.000 | 0.587 | 0.689 | 0.731 | 0.751 | 0.752 | 0.754 |
| Project BI - Detection Technology | 23.391 | 18.982 | 8.744 | 7.678 | 6.128 | 6.698 | 6.646 |
| Project BJ - SOF Counterproliferation Support | 17.983 | 21.271 | 18.300 | 20.532 | 20.916 | 20.939 | 20.970 |
| Project BK - Counterforce | 47.041 | 67.039 | 76.849 | 80.430 | 82.111 | 83.204 | 85.133 |
| Project BN -Unconventional Nuclear Warfare Defense | 1.424 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

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

A. Mission Description and Budget Item Justification:

This program element reduces WMD proliferation and enhances WMD defeat capabilities through advanced technology development. To accomplish this objective, Small Business Innovative Research and four project areas were developed: Detection Technology, Special Operation Forces (SOF) Counterproliferation (CP) Support, Counterforce, and Unconventional Nuclear Warfare Defense. This development supports technology requirements defined in the Joint Functional Concepts (ref CJCSI 3170.01) and the Quadrennial Defense Review (QDR) Transformational Goals.

Project BI, Detection Technology develops equipment and procedures for data exchanges, on-site and aerial inspections and monitoring, and off-site analysis to meet treaty specifications and implement confidence-building measures. This project focuses on technologies to monitor, detect, identify and locate strategic, conventional and improvised weapons, components, or materials, to support DoD requirements in the areas of combating terrorism, counter- and non-proliferation, homeland defense, and international initiatives and agreements. Efforts under this project also support international peacekeeping and nonproliferation objectives.

Project BJ, SOF Counterproliferation Support enables the Joint Functional Concept, Force Application, through development of SOF CP technologies focused on countering nuclear, biological, and chemical weapons and their means of delivery (NBC/M). This project develops tools to identify, characterize and defeat adversary's NBC/M research, production, storage, operations, support and command and control facilities while mitigating collateral hazards.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | | R-1 ITEM NOMENCLATURE: Proliferation Prevention and Defeat; 0603160BR |

Project BK, Counterforce supports the Joint Functional Concept, Force Application and the QDR transformational Goal to Deny Enemy Sanctuary with emphasis on functional kill, hard kill and mitigating collateral effects. This project develops, demonstrates, and transitions CP technologies to combatant commands and Services to exploit ongoing DoD agency, Service laboratory, and Department of Energy laboratory technology programs.

B. Program Change Summary:

| (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---|---------------|----------------|----------------|
| Previous President's Budget | 90.362 | 96.143 | 103.090 |
| Current President's Budget | 89.839 | 107.879 | 104.582 |
| Total Adjustment | -0.523 | 11.736 | 1.492 |
| Congressional program reductions | | | |
| Congressional reductions | | -1.564 | |
| Congressional increases | | 13.300 | |
| Reprogramming | | | |
| Classified Program Transfer | | | |
| Other Program Adjustments | -0.523 | | 1.492 |
| SBIR/STTR Transfer | | | |

Change Summary Explanation:

- The decrease in the FY 2005 funding profile from the previous submission to the current President's Budget is the result of a Small Business Innovative Research (SBIR) funding transfer and a reduction to support the Department of Energy. During the year of execution, SBIR funding is consolidated into PE 0605502BR "Small Business Innovative Research" for execution.
- The increase in FY 2006 from the previous submission to the current President's Budget is the result of the FY 2006 DoD Appropriation Act (P.L. 109-359) that contained several Congressional increases and several undistributed Congressional reductions that were proportionally applied to the entire DTRA RDT&E program. This program received a -\$1.564 million reduction. This program received Congressional increases in the amount of \$13.300 million.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY | R-1 ITEM NOMENCLATURE: | |
| RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | Proliferation Prevention and Defeat; 0603160BR | |

- The increase of \$1.492 million in FY 2007 from the previous submission to the current President’s Budget reflects an increase in non-pay purchase inflation. DTRA’s program priorities are 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 DoD.
- 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; 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

E. Performance Metrics: Cost, schedule and performance are monitored via a combination of Earned Value Management System, Cost Schedule Status Reporting, and Cost Funds Status Reports.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | | PROJECT NAME and NUMBER: 0603160BR Project BB – Small Business Innovative Research |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|--|---------|---------|---------|---------|---------|---------|---------|
| Project BB - Small Business Innovative Research* | 0.000 | 0.587 | 0.689 | 0.731 | 0.751 | 0.752 | 0.754 |

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

A. Mission Description and Budget Item Justification:

This project stimulates technological innovation in the private sector, strengthens the role of small business in meeting DoD research and development needs, 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 2005 | FY 2006 | FY 2007 |
|------------------------------------|---------|---------|---------|
| Small Business Innovative Research | 0.000 | 0.587 | 0.689 |

FY 2005 Accomplishments:

- Not Applicable.

FY 2006 Plans:

- Fund 11.0 percent of DTRA SBIR investment including:
 - Up to three Phase I SBIR contracts from proposals from FY 2006 topic areas including WMD Dispersal Device Defeat, Advanced X-ray Simulator; Next Generation Blast Mitigation, Weapons of Mass Destruction (WMD) Hazard Modeling and Simulation, Integrated WMD Toolset Near Real Time Response, Chemical/Biological Agent Deny and Defeat, Enhanced Deep Earth Penetration Capability, and Energetic Materials and Weapon Concepts.
 - Share of incremental funding of FY 2005 Phase I and FY 2004 Phase II SBIR contract awards.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BB – Small Business Innovative Research | |

FY 2007 Plans:

- Fund 12.3 percent of DTRA SBIR investment including:
 - Up to four Phase I SBIR contracts to perform feasibility studies on FY 2007 topics.
 - Share of incremental funding of FY 2006 Phase I and FY 2005 Phase II SBIR contract awards.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BI – Detection Technology | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|-----------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Project BI - Detection Technology | 23.391 | 18.982 | 8.744 | 7.678 | 6.128 | 6.698 | 6.646 |

Note: FY2005 and FY2006 resources reflect Congressional Adjustments of \$17.7 M and \$13.38 M, respectively.

A. Mission Description and Budget Item Justification:

This project develops technologies to achieve national defense counter- and non proliferation, as well as arms control objectives. Major activities include:

- Develop technologies to monitor, detect, identify and locate strategic, conventional and improvised weapons, components, or materials. In addition, provide improved detection systems for radiological or high explosive materials under cooperative and non-cooperative conditions providing increased range of detection, lower costs, lower weight and better resolution, higher sensitivity, and greater discrimination to minimize false positive and false negative readings.
- Develop and test enhanced operational systems supporting DoD requirements employing advances in solid state nuclear detectors, processing electronics, analysis software, and identification technology, and integrated nuclear/biological/chemical sensor technology.
- Develop procedures and equipment that will enable the United States government to effectively monitor compliance with current and projected international agreements in the most non-intrusive and cost-effective manner.
- Develop technology to provide information collection, processing and dissemination capabilities to meet notification and reporting requirements.
- Perform technology assessments and provide technical input to support development of innovative agreements addressing transparency, cooperation, and confidence-building issues in new topical areas and/or specific geographical regions.

The Arms Control Information and Notification (ACIN) sub-Program provides an integrated and comprehensive approach to meet technology requirements associated with achieving national defense nonproliferation and arms control objectives. Major activities include:

- Develop technologies to monitor, detect, identify and locate strategic, conventional and improvised weapons, components, or materials to support DoD requirements in the areas of combating terrorism, counter- and non- proliferation, homeland defense, and international initiatives and agreements. In addition, this effort provides improved detection systems for radiological or high explosive materials under

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BI – Detection Technology | |

cooperative and non-cooperative conditions providing increased range of detection, lower costs, lower weight and better resolution, higher sensitivity, and greater discrimination to minimize false positive and false negative readings.

- Develop and test enhanced operational systems supporting DoD requirements employing advances in solid state nuclear detectors, processing electronics, analysis software, and identification technology, and integrated nuclear/biological/chemical sensor technology.
- Develop procedures and equipment that will enable the United States government to effectively monitor compliance, and accomplish reporting associated with current and projected international agreements in the most non-intrusive and cost-effective manner. Develop technology to provide information collection, processing and dissemination capabilities to meet notification and reporting requirements. Develop technologies to synergistically support international peacekeeping efforts and other nonproliferation initiatives.

Perform technology assessments and provide technical input to support development of innovative agreements addressing transparency, cooperation, and confidence-building issues in new topical areas and/or specific geographical regions.

Arms Control Information and Notification (ACIN) Program provides new information technology (IT) capabilities to ensure accurate and reliable reporting for U.S. legally and politically binding international treaties and agreements. Additionally, it will also facilitate existing and emerging arms control on-site inspection and planning activities. It also replaces the legacy system (Compliance Monitoring and Tracking System - CMTS).

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Detection Technology | 18.707 | 15.869 | 7.208 |

Re-titled from “Arms Control Technology” to "Detection Technology" in FY 2005 to better define the program.

FY 2005 Accomplishments:

- Completed RDT&E efforts in support of the Open Skies Treaty sensor development and evaluation program and transitioned program to operational enterprise (On-Site Inspection).
- Continued program for developing enhanced detection systems exploiting advances in solid state nuclear detectors, processing electronics, analysis software, identification technology, and integrated nuclear/biological/chemical sensor technology, eliminating

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BI – Detection Technology | |

the logistical burden of cryogenic cooling (super cold) as well as bulky gas detectors, completing proof-of-concept solid state neutron detectors, pixellated gamma-ray detectors, and novel scintillation detectors.

- Initiated an effort to develop a modular nuclear and radiation detection system capable of being mounted on multiple platforms (vehicular, aerial, marine, and handheld) and being deployed in both overt and covert situations which can be seamlessly integrated into a sensor network to provide battlespace awareness for the theater commander, leading to a Joint/Advanced Concept Demonstration effort in FY 2006.

FY 2006 Plans:

- Continue program for developing detection systems exploiting advances in solid state nuclear detectors, processing electronics, analysis software, identification technology, and integrated nuclear/biological/chemical sensor technology, eliminating the logistical burden of cryogenic cooling as well as bulky gas detectors. Complete laboratory prototype solid state neutron detectors and novel scintillation detectors.
- Initiate a Joint/Advanced Concept Technology Demonstration effort to develop and demonstrate a modular nuclear and radiation detection system capable of being mounted on multiple platforms (vehicular, aerial, marine, and handheld) and being deployed in both overt and covert situations which can be seamlessly integrated into a sensor network to provide battlespace awareness for the theater commander. This includes a \$6.800M Congressional Adjustment in support of Fiber Radiation Detector and Guardian development
- Continuation of an industry-based research program for developing advanced nuclear detectors, processing electronics, and combined nuclear/biological/chemical sensors based on a Congressional Adjustment for “Innovative Technology and Equipment to Counter Nuclear, Biological, Chemical (NBC) Proliferation and Terrorism”.
- Radiation Detection. Continue spiral development and testing of enhanced DETECTIVE electromagnetically cooled gamma ray spectrometer units to develop spectroscopic radiation portal monitors and support field operations with portable detectors based on a Congressional Adjustment for “DETECTIVE (High Purity Germanium) Radiation Portal Monitors”.
- Initiate an effort to improve, enhance, demonstrate and exploit the quality, size and capability of radiation detection crystals, both scintillator and semiconductor materials, to detect nuclear weapons materials in the field and in National Defense situations based on a Congressional Adjustment for “New Technology for Detecting Nuclear Weapons Materials”.
- Initiate development of a baseline DoD large standoff active interrogation system to provide a standard for evaluating progress and capabilities in standoff detection and warning of hidden and shielded nuclear material.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY | PROJECT NAME AND NUMBER: 0603160BR | |
| RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | Project BI – Detection Technology | |

FY 2007 Plans:

- Continue program for developing detection systems exploiting advances in solid state nuclear detectors, processing electronics, analysis software, identification technology, and integrated nuclear/biological/chemical sensor technology, eliminating the logistical burden of cryogenic cooling as well as bulky gas detectors. Complete prototype pixellated gamma ray spectrometer and novel scintillating crystal detectors with enhanced energy resolution.
- Execute a Joint/Advanced Concept Technology Demonstration effort demonstrating a modular nuclear radiation detection system capable of being mounted on multiple platforms (vehicular, aerial, marine, and handheld) and being deployed in both overt and covert situations which can be seamlessly integrated into a sensor network to provide battlespace awareness for the theater commander. This ACTD should result in transitioning a viable modular nuclear detection system to Combatant Commands.
- Continue development of a baseline DoD large standoff active interrogation system to provide a standard for evaluating progress & capabilities in standoff detection and warning of hidden and shielded nuclear material. Estimated completion of baseline system in early FY 2008.
- Initiate efforts to develop detection systems for shielded and hidden nuclear weapons and materials not primarily based on neutron or gamma (nuclear radiation) detection but on alternate physical principles that might obviate many of the physical limitations presented by nuclear radiation detection. Estimated proof-of-principle prototypes in FY 2009 for test and evaluation.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---|---------|---------|---------|
| Arms Control Information & Notification Program | 4.684 | 3.113 | 1.536 |

FY 2005 Accomplishments:

- Developed treaty support information management capabilities under the Arms Control Information and Notification (ACIN) Program including:
 - U.S. European Command treaty compliant Reporting module and Inspection Planning Tool.
 - Annual Exchange of Information (AEI) Chart Generation for Conventional Forces in Europe (CFE) Treaty, Confidence and Security Building Measures in Europe (CSBM Agreement).
 - New force structure data management capability for U.S. Central Command (USCENTCOM) providing greater asset visibility.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BI – Detection Technology | |

- Tested an integrated Continuity of Operations (COOP) capabilities for the Compliance Monitoring and Tracking System (CMTS) and Strategic Arms Reduction Treaty (START) Accounting and Reporting System (STARS) with the U.S. Air Force at Langley Air Force Base.

FY 2006 Plans:

- Continue state-of-the-art technologies development of next generation treaty support information management capabilities under the Arms Control Information and Notification (ACIN) Program developing:
 - Transparency in Armaments (TIA)
 - Global Exchange of Military Information (GEMI)
 - Wassenaar Arrangement (WA)
 - Open Skies Treaty (OS)
 - Unit Transactions

FY 2007 Plans:

- Continue state-of-the-art technologies development of next generation treaty support information management capabilities under the Arms Control Information and Notification (ACIN) Program for Adapted Conventional Forces in Europe (aCFE).

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | | PROJECT NAME AND NUMBER: 0603160BR Project BJ – SOF Counterproliferation Support |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---------|---------|---------|---------|---------|---------|---------|
| Project BJ - SOF Counterproliferation Support | 17.983 | 21.271 | 18.300 | 20.532 | 20.916 | 20.939 | 20.970 |

A. Mission Description and Budget Item Justification:

This project supports the Joint Functional Concept of Force Application by developing and demonstrating technologies that enable Special Operations Forces (SOF) to detect, disable, neutralize and render safe Weapons of Mass Destruction (WMD) and their associated facilities. This mission within Force Application has been identified as a critical national priority assigned to SOF. The goal of this project is to provide management oversight and technical assistance for SOF-unique technologies, and develop enhanced SOF capabilities.

The following programs are currently planned: SOF Counterproliferation (CP) Research and Development (R&D) and Manportable Agent Defeat. These two programs are described in the following paragraphs:

- The SOF CP R&D Program demonstrates SOF-unique devices that enable SOF to detect, disable and neutralize WMD and their associated facilities. This project directly supports SOF contributions to the nation's effort to counter the spread of WMD. Efforts in this project include: the defeat of hard and deeply buried targets (HDBT), explosive ordnance disposal (EOD) and maritime efforts to prevent the spread of WMD technology. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01 dated 1 March 2001 (Classification of CP).
- The Manportable Agent Defeat program develops a full spectrum of complementary capabilities for Counter Terrorism (CT) and CP that will provide the Department of Defense, Combatant Commanders (COCOM) and Other Government Agencies (OGA) the ability to rapidly detect and destroy WMD in various backgrounds, concentrations and forms. This program also analyses the current knowledge base for detection and decontamination of Chemical, Biological, Radiological and Nuclear (CBRN) materials. DTRA will provide, upon request, direct program support to develop enhanced capabilities for USSOCOM applications that expand this technology base and mitigate mid-term deficiencies. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01 dated 1 March 2001 (Classification of CP).

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | | PROJECT NAME AND NUMBER: 0603160BR Project BJ – SOF Counterproliferation Support |

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|----------------------------------|---------|---------|---------|
| SOF Counterproliferation Support | 17.983 | 21.271 | 18.300 |

FY 2005 Accomplishments:

- Specific details are classified.

FY 2006 Plans:

- Specific details are classified.

FY 2007 Plans:

- Specific details are classified.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---------------------------|---------|---------|---------|---------|---------|---------|---------|
| Project BK - Counterforce | 47.041 | 67.039 | 76.849 | 80.430 | 82.111 | 83.204 | 85.133 |

A. Mission Description and Budget Item Justification:

Project BK develops and demonstrates technologies to strengthen joint and combined warfighting capabilities useful in the Global War on Terrorism (GWOT) and those that demonstrate integrated attack technologies used against Hard & Deeply Buried Targets (HDBT) that house WMD. The objectives of this program is to develop technologies, demonstrate prototype systems in an operationally realistic environment, support operators in defining innovative concepts of operation, and provide combatant commanders with enhanced capabilities that respond to potential adversaries' capability to develop and/or employ chemical, biological, radiological, and nuclear (CBRNE) weapons. The U.S. requires the capability to attack and neutralize CBRNE research, production, storage, operations and support, and command and control facilities while mitigating collateral effects from expulsion and release of CBRNE agents. Potential targets include mobile and fixed, above ground and underground, hardened and unhardened facilities, as well as related Command, Control, Communications and Intelligence (C3I) facilities, and transshipment and delivery systems. The goal is rapid development and demonstration of enhanced counterforce mission capabilities that include, but are not limited to, advanced conventional and non-conventional (non-nuclear) weapons, application of stand-off technologies for WMD combat assessment, integration of global strike technologies, and target-attack planning tools that optimize weapon and sensor employment.

This project emphasizes technology demonstrations to include Advanced Technology Demonstrations (ATDs) and Advanced Concept Technology Demonstrations (ACTDs). The project is divided into four mission areas, WMD Counterforce Applications, CBRNE Counterproliferation Support, Global Strike Integration Technologies, and Hard Target Defeat. Major projects are described in the following paragraphs:

- WMD Counterforce Applications:
 - The Agent Defeat, Deny, Disrupt (AD3) program is a DTRA-led effort that integrates efforts by the U.S. Air Force, the U.S. Navy and several national laboratories. The objectives are to develop, demonstrate and transition an enhanced capability to either defeat; deny access to WMD material, systems, and processes; or disrupt the adversary's capability to employ those materials or systems, while minimizing the collateral effects of employing this enhanced capability. Collateral effects test data will be obtained to enhance future weapons design and target planning tools. The program started in FY 2002 as the Prompt Agent Defeat (PAD)

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|--|--|---------------------|
| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce | |

program and has been expanded to its current scope which develops next generation AD3 payloads, integrates them, with full validation through a comprehensive Developmental Test & Evaluation program, into current and future weapon systems with minimal impact on operational Tactics, Techniques and Procedures (TTPs), and then verifies weapon combat effectiveness through Operational Test & Evaluation prior to transitioning to the warfighter. This program responds to the 1994 U.S. Air Force Mission Need Statement for Agent Defeat Weapons and emergent Initial Capabilities Documents (ICDs) sponsored by Combatant Command (COCOM) and Service. This program includes development, demonstration, and enhancement of weapons specifically designed to defeat agents or to deny or disrupt their use. These weapons include a specific capability to interface with ISR assets for improved post attack assessment capability. AD3 depends on the technology base PE 0602716BR, Project BD for weapons phenomenology and advanced sub- and full-scale weapon effects and collateral release diagnostics. The AD3 program also serves as the Executive Secretary to the NCB/DDR&E Agent Defeat Initiative which functions as the principle OSD integrator of AD3 mission technology development, testing, and transition efforts.

- The WMD Combat Assessment program has evolved from Counterproliferation 1 (CP1) and Counterproliferation 2 (CP2) Advanced Concept and Technology Demonstration(s) (ACTD) sensor product areas to provide WMD combat assessment capabilities. Product areas efforts will provide improved warfighting capabilities against the spectrum of WMD-related facilities. These efforts will continue to leverage existing programs to (1) evaluate near-term technologies; (2) define concepts of operation and system architecture for chemical, biological, and radiological combat assessment; (3) produce data fusion and mission planning modules to meet user requirements; and (4) integrate chemical, biological, and radiological combat assessment capabilities onto delivery systems, such as unmanned air vehicle (UAV) and expendable mini-UAV platforms. This effort will further demonstrate a system capability to confirm, identify, and assess the release of chemical/biological/radiological agents in support of attacks on CBRNE facilities and assist in predicting transport patterns by updating pre-strike predictions of the potentially hazardous plume with real-time data. The combat assessment product area will not develop its own CBR sensors, but will leverage and/or modify ongoing CBR sensor efforts within the chemical and biological defense community to minimize program risk for applying this technology to counterforce missions. In CP2, a Chemical Combat Assessment System (CCAS) was developed and demonstrated. Final demonstrations were in FY 2003 with transition of residual activities during FY 2004 and FY 2005. The Biological Combat Assessment System (BCAS) leverages the development work completed and demonstrated for the Chemical Combat Assessment System and will demonstrate a biological assessment capability that supports counterforce missions. BCAS activities began in FY 2004 with the development of a Capabilities Requirements Document. The BCAS ATD will include two spiral demonstrations. Spiral 1 (2Q FY 2007) is intended to demonstrate cloud with biological sample collection.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce | |

Spiral 2 (4Q FY 2008) is intended to demonstrate point biological sample collection and identification. U.S. Pacific Command (USPACOM) is the Advanced Technology Demonstration (ATD) operational sponsor. BCAS supports Pacific Command's Biological Weapons Countermeasures Program (BWCP).

- The Counterforce Weapons and Payloads Activity includes programs to develop weapon-borne taggants. The Counterforce Taggant Technology program will conduct sub-scale and full-scale tests of promising taggants to help in the location and tracking of biological agent simulants in explosive plumes.
- The WMD Planning Tools activity examines weapon effects of attacks on time-sensitive targets (TST). Test data collected during simulated TST attacks will be used to develop models for WMD planning tools and to develop tactics for attacks on TST that reduce the potential for collateral effects.
- The WMD Counterforce Demonstrations activity plans and conducts field demonstrations of enhanced weapons technology to address COCOM capability gaps in the areas of standoff and direct attack WMD counterforce.
- CBRNE Counterproliferation (CP) Support:
 - The Biological Advanced Concept Technology Demonstration (ACTD) was transferred from Project BJ in FY 2003. The Biological ACTD integrates existing and developing technologies to achieve capabilities needed by Special Operations Forces (SOF) for CP operations against biological warfare production, storage, and weaponization facilities. The objective is to enhance Geographical Combatant Commander's CP capabilities against a BW program. The ACTD acts as a forcing function across DoD to develop Joint Doctrine for CP of biological warfare infrastructure. Scheduled for June 2003, the final demonstration was delayed one year due to real-world operational requirements. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01, dated 1 March 2001 (Classification of CP).
 - The Chemical Advanced Technology Demonstration (ATD) integrates existing and developing technologies to produce unique capabilities for CP operations against chemical warfare production, storage, and weaponization facilities. The objective is to enhance to the Geographical Combatant Commander's CP capabilities against a Chemical Weapons (CW) program. These capabilities will be adaptable to other Areas of Responsibility (AORs). The ATD acts as a forcing function across DoD to develop Joint Doctrine for CP of chemical warfare infrastructure. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01, dated 1 March 2001 (Classification of CP).
 - CBRNE Venture develops specialized technologies and equipment prototypes to detect, disable, render safe, and recover critical components from WMD devices in non-permissive and time-sensitive environments. This effort began in FY 2003.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce | |

- The Hard Target Defeat (HTD) program develops and demonstrates new weapons, delivery concepts, and planning capabilities to defeat Hard and Deeply Buried Targets. The following demonstrations are part of the current plan:
 - The Thermobaric ACTD will take advantage of existing technologies to weaponize, demonstrate, and deliver an improved weapon system for the functional defeat of tunnel targets. The program will take an overall systems approach to integrate improvements in flight guidance software for the Enhanced Guided Bomb Unit (EGBU-15), a newly developed 2000 lb. class Bomb Live Unit (BLU)-121/B hardened steel warhead case, and an enhanced blast explosive for improved weapon effects in a tunnel environment. Prototypes will be tested under operational conditions to verify their performance, and residual assets will be provided to the customer as an interim capability to defeat tunnel targets. The Thermobaric ACTD conducted three operational demonstrations in FY 2005 against an operationally representative underground facility complex.
 - The Tunnel Target Defeat ACTD will develop a planning tool that will improve the warfighter's confidence in selecting the smallest proper nuclear yield necessary to destroy underground facilities while minimizing collateral damage. The focus of the demonstration is to reduce the uncertainties in target characterization and weapon effect/target response. Target characterization uncertainties include those related to determining the target function, layout, operational status, and the geological and geotechnical features. Weapons effects/tunnel response uncertainties are associated with predicting ground shock and tunnel response in layered and jointed media.
 - The Intelligent Munition for the Precision Attack on Critical Targets (IMPACT) Advanced Technology Demonstration (ATD) will develop a demonstration system using existing technology and conduct a proof-of-concept demonstration for defeating ground combat vehicles that take sanctuary in tunnel complexes. These vehicles include multiple rocket launch systems (MRLS) and theater ballistic missile systems (TBM) that attack while outside the tunnel. These vehicles reduce their vulnerability by retreating into tunnels once launch operations have concluded. This Proof of Concept Demonstration will demonstrate a means to provide a quick response to kill these targets while they are most vulnerable during launch operations.
- Global Strike Integration Technologies:
 - The Global Strike program integrates capabilities to characterize, plan, execute and assess limited duration rapid response strikes, against any target, anywhere on the globe, with a variety of weapons. The Global Strike program at DTRA will integrate ongoing efforts between USSTRATCOM, multiple DTRA projects and the Intelligence Community to reduce the time required to plan, execute and assess the results of a Global Strike mission. One of these efforts is the development, integration and eventual transition of a weapon-borne sensor system to be used by the Warfighter to conduct combat assessment. The Global Strike

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY | PROJECT NAME AND NUMBER: 0603160BR | |
| RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | Project BK - Counterforce | |

program elements are planning and coordination, integration and test and demonstration of Global Strike concepts. The Global Strike project at DTRA is an outgrowth of existing efforts currently funded under project BK. Accomplishments for FY 2005 are described under WMD Counterforce Applications. Plans for FY 2006 and subsequent years are described under Global Strike Integration.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-------------------------------|---------|---------|---------|
| WMD Counterforce Applications | 21.037 | 35.639 | 49.559 |

FY 2005 Accomplishments:

- Continued Agent Defeat, Deny, Disrupt (AD3) program. Conducted Thermal Overload Agent Simulant Test to define the upper bounds for bulk Agent Defeat concepts based on thermal killing mechanisms. Conducted sub-scale live simulant testing of novel energetic compounds for their applicability as fill for the next generation of counterforce Agent Defeat weapons. Developed, tested, and validated new test diagnostics for sub-scale live simulant test beds.
- Continued WMD Combat Assessment program. Initiated source selection for the Biological Combat Assessment System Advanced Technology Demonstration (BCAS ATD) unmanned aerial vehicle/sensor performers. Conducted "Bio-Plume" Phase Two testing to characterize typical post-strike plumes released from WMD (biological) targets and develop an instrumented test range to support the BCAS ATD. Demonstrated deployment of a mini-Unmanned Aerial Vehicle (FINDER) from the Predator UAV to provide reconnaissance capability and enable pre-strike WMD target identification and post-strike battle damage assessment.
- Continued Counterforce Weapons and Payloads activity. Completed Phase I Taggant Technology (lab/small scale testing) to determine survivability and optical properties of taggant candidates and awarded Phase 2 Taggant Technology contracts (small and mid scale testing) to optimize taggant properties for biological plume tracking.
- Continued WMD Planning Tools activity. Fabricated and delivered two mobile, medium range ballistic missile (MRBM) targets for joint DTRA, Navy cruise missile testing. Completed analysis and two full-scale static warhead detonation tests to define low-collateral-effect strike tactics versus this MRBM target and assess results.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce | |

- Continued WMD Counterforce Demonstrations activity. Began weapon-borne sensor feasibility studies. Completed assembly of six Battle Damage Reporting System modules to support weapon-borne sensor testing and completed two builds of an air-deliverable chemical sensor and unattended ground sensor package for a weapon-borne sensor flight test.

FY 2006 Plans:

- Continue Agent Defeat, Deny, Disrupt (AD3) program. Conduct full-scale testing with Agent Defeat alternate-fill weapon against hardened, cut-and-cover simulated bio storage facility. Conduct sub-scale live simulant testing of novel energetic compounds for their applicability as fills for the next generation of counterforce Agent Defeat weapons. Perform sub-scale live simulant testing to provide data to validate model predictions for new Tactics, Techniques, and Procedures for use against WMD targets. Conduct sub-scale live simulant testing for development and validation of new test diagnostics and protocols against Biological and Chemical simulants simultaneously. Initiate preliminary design efforts for a reusable full-scale live simulant test facility.
- Continue WMD Combat Assessment program. Complete source selection of the BCAS unmanned aerial vehicle/sensor performers and initiate system development and integration. Start development of the Biological Assessment Mobile Laboratory (BAML) and the Government Command, Control & Communications (GC3) test assets for the BCAS ATD. Conduct Bio-Plume Phase Three testing to continue to characterize typical post-strike plumes released from biological targets and develop an instrumented test range to support the BCAS ATD. Develop and demonstrate an infrared, video payload for the Target Area Strike Support (TASS) system to provide Air Force Special Operations Command (AFSOC) the capability to acquire off-board, below the weather imagery for pre-strike target identification and post-strike battle damage assessment for missions accomplished by AC-130 gunship and MQ-1 Predator unmanned air vehicle.
- Continue Counterforce Weapons and Payloads activity. Initiate Foreign Comparative Test program to evaluate the German Programmable Intelligent Multi-Purpose Fuze (PIMPF) ability to detect and count voids in prosecuting hard, deeply buried targets. Conduct small scale taggant explosive, aerosolized tracking and insensitive munitions testing to enhance taggant survivability, optimize taggant optical properties and develop weapons integration concepts to support post-strike combat assessment of strikes against known / suspected WMD targets.
- Continue WMD Planning Tools activity. Fabricate and deliver two mobile, medium range ballistic missile (MRBM) targets for Navy Hellfire missile testing. Complete analysis and two full-scale static warhead detonation tests to define low collateral effect strike tactics versus this MRBM target and assess results. Define requirements for planning tool improvement to predict effects of strikes on mobile WMD targets.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY | PROJECT NAME AND NUMBER: 0603160BR | |
| RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | Project BK - Counterforce | |

- Continue WMD Counterforce Demonstrations activity. Prepare strategy and plans for conducting a demonstration of systems and techniques for combating enhanced WMD weapons. This will address COCOM counterforce capability gaps in the areas of standoff and direct attack WMD counterforce.

FY 2007 Plans:

- Continue Agent Defeat, Deny, Disrupt (AD3) program. Conduct sub- and full-scale testing of candidate, Agent Defeat warhead(s) compatible with standoff platforms. Conduct tests against wet and dry biological agent targets and compare the results with high explosive baseline. Design and develop a WMD counterforce test-bed to improve measurement, diagnostic and live fire capabilities for WMD counterforce related systems. Conduct sub-scale live simulant testing of novel energetic compounds for their applicability as fills for the next generation of counterforce Agent Defeat weapons. Perform sub-scale live simulant testing to provide data to validate model predictions and next generation test diagnostics. Initiate development of next generation of Agent Deny/Disrupt weapon.
- Continue WMD Combat Assessment program. Continue development and systems integration of the BCAS and conduct system-level verification testing in preparation for the Spiral One Demonstration. Complete development of the Biological Assessment Mobile Laboratory (BAML) and the Government Command, Control & Communications (GC3) test assets for the BCAS ATD.
- Continue Counterforce Weapons and Payloads activity. Initiate the development and integration of all taggant sensor and weapon components to support mid/full scale testing of a fully integrated taggant weapon system against a simulated WMD target.
- Continue WMD Planning Tools activity. Define and implement planning tool improvements to better predict effects of strikes on fixed and mobile WMD targets.
- Continue WMD Counterforce Demonstrations activity. Initiate an Advanced Technology Demonstration to address COCOM capability gaps in the areas of standoff and direct attack for of enhanced WMD weapons.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|--|---------|---------|---------|
| SOF/CBRNE Counterproliferation Support | 14.671 | 8.784 | 9.531 |

FY 2005 Accomplishments:

- Completed construction of two high fidelity test facilities to evaluate technologies developed through the Chemical ATD. Finalized development and completed Military Utility Assessment on the Unknown Substance Identifier capable of identifying

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce | |

nerve and blister agents, toxic industrial chemicals, WMD precursors, and other agents/chemicals (\$50K unit cost). Established Military Utility Assessment on the Chemical Protective overboot made from HSF™ barrier fabric. Funded publication of Nano-Particle Working Group paper on shortcomings of current Personnel Protective Equipment technologies. On-site programmatic and testing support provided by Dugway Proving Ground, site for the FY06 technology demonstration. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01, dated 1 March 2001 (Classification of Counterproliferation).

- Completed a review of the technologies that were submitted in response to a DTRA Broad Agency Announcement. Issued formal Request for Proposals for chemical agent defeat technology using formulations in nano-technology and classified technologies. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01, dated 1 March 2001 (Classification of Counterproliferation).

FY 2006 Plans:

- Deliver selected Chemical ATD technologies. Complete construction of test fixtures for final demonstration. Conduct Chemical ATD final demonstration in July 2006. Execute smooth transition of ATD residuals that demonstrate military utility in the demonstration. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01, dated 1 March 2001 (Classification of Counterproliferation).
- Continue spiral development of selected CBRNE Venture technologies in Non-Intrusive Detection, Denied Area Mapping (navigation in areas otherwise restricted), Integrated Micro-Climatization Suit, and other advanced technologies. Conduct market research for new set of user requirements. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01, dated 1 March 2001 (Classification of Counterproliferation).

FY 2007 Plans:

- Continue spiral development of selected CBRNE Venture technologies. Conduct scientific and operational reviews for proposals received against new solicitations and award Phase II contracts. Iteratively develop selected technologies. Conduct individual technology testing as required. Conduct Integrated Project Reviews (IPR) for each technology. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01, dated 1 March 2001 (Classification of Counterproliferation).

UNCLASSIFIED

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| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce |

- Begin Global War on Terrorism (GWOT) ATD. Details of this program are classified per Chairman, Joint Chief of Staff Manual (CJCSM) 5225-01, dated 1 March 2001 (Classification of Counterproliferation).

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|-----------------------|---------|---------|---------|
| Hard Target Defeat | 11.333 | 19.366 | 14.509 |

FY 2005 Accomplishments:

- Completed Thermobaric ACTD weapon qualification tests (i.e. sled track, insensitive munitions and captive-carry tests). Produced test assets and conducted operational flight demonstrations. Conducted a planning exercise with USFK/USPACOM staff for the operational demonstrations. Completed final concept of operations (CONOPs) for in conjunction with USFK/PACOM staff. Initiated manufacturing study to reduce cost / improve production efficiency for Bomb Live Unit (BLU)-121/B warhead. Conducted a Military Utility Assessment. Began an alternative target study for the BLU-121/B warhead evaluating the utility of the warhead for other target types. Delivered residual Thermobaric ACTD assets to the Air Force.
- Completed Tunnel Target Defeat (TTD) ACTD design for a large-scale tunnel defeat demonstration event. Completed an intermediate scaled test to measure ground shock and tunnel damage at a limestone quarry. Completed a report on geostatistically-based site characterization and 3-D Rock Property Modeling for intermediate scale testing. Completed a preliminary 3-D rock strati-graphic and rock property model and developed site characterization plan for a full-scale tunnel ground shock defeat demonstration. Documented and evaluated computer code predictions of Jointed Limestone Tests (JOLT) and intermediate scale test results.
- Developed the operational concept for the Intelligent Munitions for Precision Attack of Critical Targets (IMPACT) ATD Proof of Concept Demonstration. This ATD develops and demonstrates a low-cost, rapid response option for ground forces engaging time critical targets operating from Hard & Deeply Buried Targets.

FY 2006 Plans:

- Deliver Thermobaric ACTD residual warhead assets to theater. Provide a transition support plan to transition the weapon into a Service acquisition program. Provide sustaining support and training for Thermobaric residual weapons. Complete the alternative target study for the Bomb Live Unit (BLU)-121/B. Analyze the suitability of alternative guidance kits for use with the BLU-121/B warhead. Conduct demonstration of BLU-121/B warhead with EGBU-27 guidance kit.

UNCLASSIFIED

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|--|--|---------------------|
| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce | |

- Conduct the Tunnel Target Defeat ACTD large-scale tunnel defeat demonstration using high explosives to produce the desired ground shock environment at the Department of Energy's Nevada Test Site. Deliver validated analysis and planning tools for use in characterizing and "weaponeering" the large-scale test event. Conduct a Military Utility Assessment. Prepare final program documentation and reports. Begin transition of improved tunnel ground shock defeat planning tools to USSTRATCOM.
- Complete Intelligent Munitions for Precision Attack of Critical Targets (IMPACT) ATD system component study and begin concept development.

FY 2007 Plans:

- Provide sustaining support and training for Thermobaric ACTD residual weapons. Conduct demonstration of BLU-121/B warhead with EGBU-24 guidance kit.
- Provide transition support of improved tunnel ground shock defeat planning tools to USSTRATCOM. Complete large-scale post-test event assessment and test-site safing.
- Conduct Intelligent Munitions for Precision Attack of Critical Targets (IMPACT) Advanced Technology Demonstration.

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|--|---------|---------|---------|
| Global Strike Integration Technologies | 0.000 | 3.250 | 3.250 |

FY 2005 Accomplishments:

- FY 2005 accomplishments are described under WMD Counterforce Applications.

FY 2006 Plans:

- Continue Global Strike Integration. Complete weapon-borne sensor feasibility studies and trade-off analyses. Conduct a limited experiment, proof-of-principle flight test of the Battle Damage Reporting System using a Tomahawk Land Attack Missile – Dispenser Variant (TLAM-D). Conduct a limited experiment, proof-of-principle flight test of weapon-borne sensors using a chemical sensor and an aerial version of an unattended ground sensor in a Wind Corrected Munitions Dispenser (WCMD) Tactical Munitions Dispenser (TMD). Draft Battle Damage Assessment Concept of Operations (CONOPS).

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BK - Counterforce | |

FY 2007 Plans

- Continue Global Strike Integration. Finalize Battle Damage Assessment CONOPS. Integrate sensor output requirements. Design FY 2008 Global Strike biennial experiment.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performer: Not Applicable.

UNCLASSIFIED

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | | PROJECT NAME AND NUMBER: 0603160BR Project BN – Unconventional Nuclear Warfare Defense |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---------|---------|---------|---------|---------|---------|---------|
| Project BN - Unconventional Nuclear Warfare Defense | 1.424 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

A. Mission Description and Budget Item Justification:

The terrorist attacks of September 11, 2001 vividly demonstrated the need to expand the U.S. efforts to develop and field systems that can defend against threats posed by Weapons of Mass Destruction (WMD). One of the most unsettling and dangerous threats to the U.S. homeland is the possibility of nuclear terrorism using unconventional methods (i.e., delivery of an Improvised Nuclear Device (IND), Radiological Dispersal Device (RDD) or an actual nuclear weapon by other than missile or military aircraft). To defend against this threat, Congress and directed the Unconventional Nuclear Warfare Defense (UNWD) program and the Terrorist Device Defeat (TDD). The UNWD program is designed to develop a prescribed list of equipment and procedures for a series of systems that can detect, give early warning, and establish a successful response to an unconventional nuclear warfare (UNW) attack. At its end state, the program’s equipment list and procedures will be rapidly transferable to other interested Federal, State, local or private organizations to provide such protection to their critical sites. This list and procedures will be developed through a rigorous series of experiments, demonstrations, and red-teaming processes at four test-beds. The TDD program is intended to develop the technologies and operational concepts to defeat this emerging threat of nuclear/radiological terrorism in the form of nuclear weapons, INDs or RDDs.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|--|---------|---------|---------|
| Unconventional Nuclear Warfare Defense | 1.424 | 0.000 | 0.000 |

FY 2005 Accomplishments:

- Completes the development of a hand held chemical/biological detector to be used by Special Operations Forces under the TDD program. The CB threat has been considered as well.

UNCLASSIFIED

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|--|--|---------------------|
| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 | PROJECT NAME AND NUMBER: 0603160BR Project BN – Unconventional Nuclear Warfare Defense | |

FY 2006 Plans:

- Not Applicable.

FY 2007 Plans:

- Not Applicable.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performer: Palmar and Brigham Young University.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 | R-1 ITEM NOMENCLATURE: Critical Technology Support; 0605110BR | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Total 0605110BR Cost | 1.919 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Project BL - Militarily Critical Technologies Program | 1.919 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

A. Mission Description and Budget Item Justification:

The Militarily Critical Technologies Program (MCTP) entails several facets--the most important is the Military Critical Technologies List (MCTL). The congressionally-mandated MCTL is the fundamental source document for identification of leading edge and current technologies which must be monitored and assessed worldwide for national security and nonproliferation control of weapons of mass destruction and advanced conventional weapons. The main efforts which encompass the MCTL are:

- Continuous technical support to interdepartmental and international processes which develop multinational export control agreements on technologies of concern to DoD;
- Worldwide technology capabilities assessments for the MCTL and other U.S. Government International critical technologies efforts;
- Identification and determination of technical parameters for proposals for international control of weapons of mass destruction;
- Technical assessments to support decisions on foreign ownership of US industrial assets;
- Identification of foreign technologies of interest to the DoD and opportunities for international cooperative research and development;
- Identification of Homeland Defense and terrorism applications of militarily critical technologies.

Other activities performed by the MCTP include:

- Developing and publishing in electronic form (including Internet version, both restricted and public) various editions of the MCTL and Developing Science and Technologies List (DSTL) documents that describe the military and proliferation significance of various technologies;
- Monitoring and assessing dual-use and military technologies worldwide;
- Assisting in the development of proposals for negotiation in various multilateral export control regimes;
- Providing technical support for the review/revision of the U.S. Munitions List under the Defense Trade Security Initiative;
- Providing analytical support for Congressional reports.

This program includes funding for travel by DoD personnel in support of the management and technical objectives.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 | R-1 ITEM NOMENCLATURE: Critical Technology Support; 0605110BR | |

B. Program Change Summary:

| (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|---|--------------|--------------|--------------|
| Previous President's Budget | 1.919 | 0.000 | 0.000 |
| Current President's Budget | 1.919 | 0.000 | 0.000 |
| Total Adjustment | 0.000 | 0.000 | 0.000 |
| Congressional program reductions | | | |
| Congressional reductions | | | |
| Congressional increases | | | |
| Reprogramming | | | |
| Classified Program Transfer | | | |
| Other Program Adjustments | | | |
| SBIR/STTR Transfer | | | |

Change Summary Explanation:

- Effective FY 2006, The Military Critical Technologies Program transferred to the Office of the Undersecretary of Defense (OUSD), Acquisition Technology and Logistics (AT&L) International Technology Security (ITS) office.

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

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 | Project Name and Number: 0605110BR Critical Technology Support | |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---------|---------|---------|---------|---------|---------|---------|
| Project BL – Militarily Critical Technologies Program | 1.919 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

A. Mission Description and Budget Item Justification:

- The Militarily Critical Technologies Program provides critical data required to provide:
 - Support to the ongoing update of the Militarily Critical Technologies List (MCTL).
 - Support to the ongoing update of Developing Science and Technologies List (DSTL) documents.
 - Technical support for review/revision for the U.S. Munitions List under the Defense Trade Security Initiative.
 - Assessment of dual-use and military technology worldwide to support national security actions.
 - Proposals for negotiations in various multinational export control regimes.
 - Analytical support for various Congressional reports.
 - Identification of Homeland Defense and terrorism applications of militarily critical technologies.

B. Accomplishments/Planned Program:

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|--|---------|---------|---------|
| Militarily Critical Technologies Program | 1.919 | 0.000 | 0.000 |

FY 2005 Accomplishments:

- The FY 2005 Military Critical Technologies Program funding was issued (via Military Interdepartmental Purchase Request (MIPR)) to the Office of the Undersecretary of Defense (OUSD) Acquisition Technology and Logistics (AT&L), International Technology Security (ITS) office for execution.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 | Project Name and Number: 0605110BR Critical Technology Support | |

FY 2006 Plans:

- Effective FY 2006, the Military Critical Technologies Program will transfer to the Office of the Undersecretary of Defense (OUSD) Acquisition Technology and Logistics (AT&L) International Technology Security (ITS) office.

FY 2007 Plans:

- Not Applicable.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 | | R-1 ITEM NOMENCLATURE: Small Business Innovative Research; 0605502BR |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Total 0605502BR Cost | 6.143 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Project BB - Small Business Innovative Research (SBIR)* | 6.143 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

*In year of execution, funding is executed under PE 0605502BR “Small Business Innovative Research”.

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. Program Change Summary:

| (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 |
|------------------------------------|--------------|--------------|--------------|
| Previous President's Budget | 5.133 | 0.000 | 0.000 |
| Current President's Budget | 6.143 | 0.000 | 0.000 |
| Total Adjustment | 1.010 | 0.000 | 0.000 |
| Congressional program reductions | | | |
| Congressional reductions | | | |
| Congressional increases | | | |
| Reprogramming | | | |
| Classified Program Transfer | | | |
| Other Program Adjustments | | | |
| SBIR/STTR Transfer | 1.010 | 0.000 | 0.000 |

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| Exhibit R-2, RDT&E Budget Item Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 | R-1 ITEM NOMENCLATURE: Small Business Innovative Research; 0605502BR | |

Change Summary Explanation:

- Funding for FY 2005 for the Small Business Innovative Research Program has been consolidated in this program element for execution.

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

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Number of phase 1 awards per year, number of phase 2 awards per year, number of phase 3 awards.

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| Exhibit R-2a, RDT&E Project Justification | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 | PROJECT NAME AND NUMBER: 0605502BR Project BB - Small Business Innovative Research |

| Cost (\$ in Millions) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---------|---------|---------|---------|---------|---------|---------|
| Project BB - Small Business Innovative Research (SBIR)* | 6.143 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

* In year of execution, funding is executed under PE 0605502BR “Small Business Innovative Research”.

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 2005 | FY 2006 | FY 2007 |
|---|---------|---------|---------|
| Small Business Innovative Research (SBIR) | 6.143 | 0.000 | 0.000 |

*In year of execution, funding is executed under PE 0605502BR “Small Business Innovative Research”.

FY 2005 Accomplishments:

- Awarded 22 Phase I SBIR contracts to perform feasibility studies on FY 2005 topics.
- Awarded four Phase II SBIR contracts to perform full research and development (R&D) on successful FY 2004 Phase I efforts in chem./bio detection, neutron detection, and computational techniques supporting counterproliferation.
- Continued execution of FY 2004 Phase I and FY 2003 Phase II SBIR contract awards.

FY 2006 Plans:

- Not Applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 2006 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 | PROJECT NAME AND NUMBER: 0605502BR Project BB - Small Business Innovative Research | |

FY 2007 Plans:

- Not Applicable.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.