

## UNCLASSIFIED

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

Cost (\$ in Millions)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
<b>Total 0603160BR Cost</b>	<b>89.839</b>	<b>107.879</b>	<b>104.582</b>	<b>109.371</b>	<b>109.906</b>	<b>111.593</b>	<b>113.503</b>
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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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
<b>Previous President's Budget</b>	<b>90.362</b>	<b>96.143</b>	<b>103.090</b>
<b>Current President's Budget</b>	<b>89.839</b>	<b>107.879</b>	<b>104.582</b>
<b>Total Adjustment</b>	<b>-0.523</b>	<b>11.736</b>	<b>1.492</b>
<b>Congressional program reductions</b>			
<b>Congressional reductions</b>		<b>-1.564</b>	
<b>Congressional increases</b>		<b>13.300</b>	
<b>Reprogramming</b>			
<b>Classified Program Transfer</b>			
<b>Other Program Adjustments</b>	<b>-0.523</b>		<b>1.492</b>
<b>SBIR/STTR Transfer</b>			

**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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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.

<b>Exhibit R-2a, RDT&amp;E Project Justification</b>		Date: February 2006
<b>APPROPRIATION/BUDGET ACTIVITY</b> RDT&E, Defense-Wide/Advanced Technology Development - BA 3		<b>PROJECT NAME and NUMBER:</b> 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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**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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<b>Exhibit R-2a, RDT&amp;E Project Justification</b>		Date: February 2006
<b>APPROPRIATION/BUDGET ACTIVITY</b>	<b>PROJECT NAME AND NUMBER: 0603160BR</b>	
RDT&E, Defense-Wide/Advanced Technology Development - BA 3	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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RDT&E, Defense-Wide/Advanced Technology Development - BA 3	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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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.



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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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- 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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<b>Exhibit R-2a, RDT&amp;E Project Justification</b>		Date: February 2006
<b>APPROPRIATION/BUDGET ACTIVITY</b> RDT&E, Defense-Wide/Advanced Technology Development - BA 3		<b>PROJECT NAME AND NUMBER:</b> 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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**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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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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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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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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- 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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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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- 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.

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- 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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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).

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- 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.

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- 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).

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**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.

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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.



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**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.