Defense Threat Reduction Agency

Date: February 2003

Program Element Number	Item	Budget Activity	TOA, $ in Thousands FY2002 Cost	FY2003 Cost	FY2004 Cost	FY2005 Cost	FY2006 Cost	FY2007 Cost	FY2008 Cost	FY2009 Cost
0602715BR	Nuclear Sustainment & Counterproliferation Technologies	2	389,079	0	0	0	0	0	0	0
0602716BR	WMD Defeat technology	2	0	162,272	183,178	247,911	256,499	258,136	255,553	258,923
0602717BR	Strategic Defense Technologies	2	0	117,950	116,049	116,803	112,720	113,615	113,978	115,615
0603160BR	Counterproliferation Support	3	162,565	80,377	76,277	81,826	97,482	103,432	105,421	107,415
0603711BR	Arms Control Technology	3	60,192	43,433	4,807	14,200	14,811	21,827	24,546	24,938
0605110BR	Critical Technology Support	6	3,168	1,815	1,858	1,937	1,945	1,946	1,982	2,019
	Total RDT,&E		615,004	405,847	382,169	462,677	483,457	498,956	501,480	508,910

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** Nuclear Sustainment & Counterproliferation Technologies; 0602715BR

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total 0602715BR Cost	389.1	Realigned	0	0	0	0	0	0
Project BB Small Business Innovative Research	4.1	Realigned	0	0	0	0	0	0
Project BC Force Protection & Technology Applications	5.8	Realigned	0	0	0	0	0	0
Project BD Weapons Effects Technologies	94.4	Realigned	0	0	0	0	0	0
Project BE Testing Technologies & Integration	10.1	Realigned	0	0	0	0	0	0
Project BF CP Operational Warfighter Support	64.1	Realigned	0	0	0	0	0	0
Project BG Nuclear Operations	135.0	Realigned	0	0	0	0	0	0
Project BH System Survivability	75.6	Realigned	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

The mission of the Defense Threat Reduction Agency (DTRA) is to safeguard America and its friends from weapons of mass destruction (WMD) by reducing the present threat and preparing for the future threat. This mission directly reflects the National Military Strategy, supports the provisions of Joint Vision 2020 and is specifically directed by the JCS in the Joint Strategic Capabilities Plan (Nuclear Annex). To achieve this mission, DTRA has identified principal objectives along with strategies and tasks to ensure the objectives are met. Three of these objectives are to deter the use of WMD, reduce the present threat and prepare for the future threat. A focused, strong threat reduction technology base is critical to achieving these objectives. DTRA has taken the steps to develop this technology base.

This budget submission provides the essential technologies to deter the use of WMD and prepare for the WMD threat. These technologies can be grouped into two areas, Counterproliferation (CP) technologies and Nuclear Sustainment technologies and projects. CP technologies to include antiterrorism will help DTRA prepare for the WMD threat and support civil and military response to WMD use. Nuclear sustainment technologies and projects support the viability and credibility of the nuclear force as well as development of survivability technology for Theater Missile Defense and National Missile Defense in a nuclear environment.

- **CP Technologies:** The DTRA is the DoD focal point for programs and activities to reduce the threats posed by WMD proliferants. New, forward-thinking activities have been identified and prioritized to support the DTRA mission and the DoD CP strategy for responding to the full spectrum of crises and preparing now for an uncertain future. The CP programs support national guidance, the DTRA strategic vision, and Service and Combatant Command operational customers. This program element provides the innovative technologies and concepts underpinning all CP programs.

    - Examination of existing U.S./Allied capabilities to hold hardened, deeply buried targets at risk; evaluation of capabilities against known or projected potential targets; and evaluation of new technologies for possible application against known shortfalls.
    - Targeting and Intelligence Community (IC) support to warfighters that provides functional vulnerability assessments of hostile foreign systems.
    - Development of WMD analysis and simulation tools for the warfighter including target planning and assessment; hazardous materials transport and collateral effects prediction; consequence assessment; and anti-terrorism/force protection.
    - Development and application of state-of-the-art nuclear weapons effects models to support nuclear weapon stewardship and system hardness design.
    - Development, improvements and test engineering for the unique DoD test and simulation facilities (to include infrastructure) and enabling technologies that are used to evaluate the impact of hostile environments from conventional, nuclear, and other special weapons on military or civilian systems or targets.
    - Mission vulnerability assessments of strategic U.S./Allied systems leading to strategies for improved survivability. Provides input to assessment training programs, structural engineering designs and practices, communications and information operations, and security and

WMD protective measures to support sound mission survivability, vulnerability mitigation, and collective protection principles. Five dedicated teams accomplish up to 30 assessments per year.

- **Nuclear Sustainment:** The nuclear sustainment program, driven by the specific taskings of the National Strategy, National Military Strategy 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 Emergency Response Capability; an enhanced WMD consequence management (CM) capability to include a CM Advisory Team (CMAT); nuclear and WMD training expertise for DoD; surety risk and hazard analyses; nuclear planning systems; nuclear deterrent option analyses; technical support for Nuclear Weapons Council (NWC) and nuclear C4I requirements; and WMD threat mitigation analyses.
  - The System Survivability Project develops simulator technology (nuclear, blast, thermal, radio frequency (RF) propagation, and optical/infrared (IR) background effects), electronics technology (radiation-hardened microelectronics, balanced electromagnetic hardening technology, radio frequency threat reduction), assessment and protection technology, and provides technology to support the Congressionally mandated Nuclear Test Personnel Review. These development areas directly support the development of survivable and reliable systems for the warfighter.

Together, the Counterproliferation Technologies and 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 from counter-terrorism through conventional conflict through countering WMD threats to the maintenance of the national strategic nuclear deterrent.

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

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** Nuclear Sustainment & Counterproliferation Technologies; 0602715BR

B. Program Change Summary:

($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005
Previous Program and Budget Review	296.4	Realigned*		
Current President's Budget	389.1	Realigned*		
Total Adjustment	92.70			
Congressional program reductions				
Congressional rescissions				
Congressional increases				
Reprogrammings	92.70			
Transfer (DoD-Defense Wide)				
SBIR/STTR Transfer				

*moved to new program elements

Change Summary Explanation:

In order to better define and capture its 6.2 resources, DTRA has created two new program elements and realigned funding from this program element into the following new program elements:

- WMD Defeat Technology (0602716BR)
- Strategic Defense Technologies (0602717BR)
- Increases to FY 2002 from the previous President's Budget to the current FY 2002 Actual are the result of the Department's decision to reprogram $92.4 million to DTRA in support of a classified program. The remaining $.3 million reprogramming is the result of a below-threshold reprogramming to execute the Agency's Small Business Innovative Research program.

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

D. Acquisition Strategy: N/A

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602715BR	**PROJECT NAME AND NUMBER:** Project BB - Small Business Innovative Research (SBIR)

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BB Small Business Innovative Research	4.1	Realigned	0	0	0	0	0	0

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 2002	FY 2003	FY 2004	FY 2005
Small Business Innovative Research	4.1	Realigned	0	0

FY 2002 Accomplishments

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

FY 2003 Plans

- Funding and activities realigned to Project BB in PE 0602716BR and 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BB in PE 0602716BR and 0602717BR.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602715BR	**PROJECT NAME AND NUMBER:** Project BC – Force Protection and Technology Applications

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BC – Force Protection and Technology Applications	5.8	Realigned	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

- This project supports Assessment and Mitigation Technologies, which conducts mission vulnerability assessments of strategic U.S./Allied systems to facilitate the development of investment strategies for improved survivability, to include nuclear command and control.
- This program also ensures that assessment training programs, engineering designs, and new construction embody sound force protection, vulnerability mitigation, and collective protection principles. DTRA technologies and expertise are applied to enhance U.S. capabilities across the spectrum of the counterproliferation and force protection missions. These may include development of sensor technologies for initially identifying the consequences of Weapons of Mass Destruction (WMD) through countering or protection against this threat.
- Some of the program's products and services include the Balanced Survivability Assessments (BSA), the Smart Building program's strategic facility construction design and cost estimates, vulnerability out-briefs and written reports, overall vulnerability trend data, National and NATO conferences for Underground Facility Managers, and multi-disciplined technical engineering expertise support.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Balanced Survivability Assessments	1.0	Realigned		

2002 Accomplishments

- Conducted in conjunction with O&M funding, twenty-three balanced survivability assessments on DoD facilities as tasked by Combatant Commanders, the Joint Staff, and OSD Command, Control, Communications (C3I).
- Continued integrated vulnerability assessment of defense and critical national infrastructure facilities.

FY 2003 Plans

- Funding and activities realigned to Project BC in PE 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BC in PE 0602717BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Smart Building Program	4.8	Realigned		

FY 2002 Accomplishments

- Completed Operational Capability of integrated Smart Building (SB) system.
- Provided on site and reach-back (remote) technical support for special events.
- Began lessons learned upgrade efforts.
- Began decommissioning of SB system.

FY 2003 Plans

- Funding and activities realigned to Project BC in PE 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BC in PE 0602717BR.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers:

- Funding in the amount of $893K was provided to Science Application Inc., located in Virginia with funding obligated April 2002. Funding supported the Balanced Survivability Assessment program.
- Funding in the amount of $900K was provided to Science Application Inc., located in California with funding obligated December 2001. Funding supported the Smart Building program.
- Funding in the amount of $1.5 million was provided to the Army Research Lab, located in Maryland with funding obligated March 2002. Funding supported the Smart Building program.

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602715BR	**PROJECT NAME AND NUMBER:** Project BD - Weapon Effects Technologies	

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BD - Weapon Effects Technologies	94.4	Realigned	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

- This project provides for the development and application of products and services to meet Weapons of Mass Destruction (WMD) and other special weapon effects challenges. This is accomplished using state-of-the-art science and engineering capabilities, including advanced first principles analysis, engineering modeling, simulation and networking technologies, and precision laboratory scale and field testing capabilities (supported by Project BE-Testing Technologies and Integration). The project integrates and applies these advanced capabilities to support decision making in the face of rapidly evolving WMD threats in both military and civilian sectors. Products being developed include WMD target planning and assessment tools, WMD hazardous materials transport and collateral effects prediction tools, tools and technologies used to mitigate the effects of WMD on facilities and people, and consequence assessment/management tools to evaluate and respond to WMD events. Additionally, this project develops the enabling technologies used to produce anti-terrorist/force protection tools. This project also develops technologies to support force protection assessments and forensic analysis of terrorist events as well as advanced blast mitigation/retrofit techniques. Such tools developed on this project are used to enable other projects including Project BC-Force Protection and Technology Applications, and Project BF-CP Operational Warfighter Support. Also, they are made available to civilian, anti-terrorism and disaster response support organizations.

- This project also maintains the capability to address nuclear weapon effects problems. This involves development and application of state-of-the-art nuclear weapon effects models to DoD for survivability, operability, and battle employment planning applications. In addition, the project maintains a national archive of nuclear phenomenology, involving perishable nuclear test data and expert interpretation, weapon effects models that encode our knowledge base, and a modern computer-based architecture for retention and access to such archives. These capabilities are used in direct support of the warfighter and are used to enable other projects including Project BG-Nuclear Operations and Project BH-System Survivability.

- In direct support of these products and services to the warfighter, this project also provides and maintains a world-class High Performance Computing (HPC) architecture with high bandwidth communications required for direct support to the warfighter. This service enables the application of state-of-the-art first principles models to WMD problems and supports the development of improved models and migration to advanced computing architectures.

- In addition, this project includes funds for which the DoD has provided direction to DTRA, to initiate a new subproject known as Z-Chip (also referred to as the Study of Conceptual DoD Health Surveillance and Biodefense System). These funds are to be used to initiate development of the next-generation chip-based micro-sensor array pathogen detection technology and demonstrate the capability to fuse patient point-of-care data using health surveillance software. The system utilizes diagnosis in the early stages of disease when patients present respiratory symptoms to identify the threat agent and to recommend appropriate prophylaxis and treatment.

- Also included in this project are civilian salaries required to directly support the development of products and services provided by this project.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Targeting Support	19.6	Realigned		

FY 2002 Accomplishments

- Completed development of Munitions Effects Assessment (MEA) 4.2 and Integrated Target Planning Tool Set (ITPTS) 2.0 to support the final Second Counterproliferation (CP2) Advanced Concept Technology Development (ACTD) demonstration DIPOLE ZODIAC and the tunnel defeat demonstration.
- Performed high-fidelity analyses and precision tests to produce blast mitigation and retrofit criteria for use in joint Blast Effects Estimation Model.
- Continued development of a high fidelity, physics-based computer code for DoD High Performance Computing Program capable of generating reliable data for lethality/vulnerability model development for WMD counterforce applications.
- Began development of the capability to defeat a broad spectrum of biological threats (dry/wet spores, viruses, toxins), establish relationships between weapons concepts, their effects and biological threat agent vulnerabilities.
- Refined baseline two-dimensional Discrete Particle Model that was developed in FY 2001 capable of addressing problems associated with extreme (blast/shock) loading of reinforced concrete structures.

FY 2003 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.
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Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Phenomenology and Advanced Computing	31.6	Realigned		

FY 2002 Accomplishments

- Provided online (password protected) scientific and technical information services and products as the DoD-wide repository for test weapon effects photos, films, data, test records, and other information products.

- Completed archiving of perishable nuclear environmental radiation, thermomechanical, and electromagnetic test data.
- Provided support for Scientific Computing Communications Network and High Performance Computing (HPC) equipment, an enabler of weapon effects research and prediction.
- Initiated numerical simulation code modernization effort.
- Improved simulation of high altitude regime nuclear burst effects important for Ground-Based Midcourse Defense Program (GMD) to provide improved prediction of debris location and energy deposition, critical parameter for GMD operability.
- Continued educational seminars on the use of nuclear prediction tools for application to Missile Defense Agency (MDA) and communications systems.
- Began integration of nuclear weapon disturbed environments into space weather program.
- Completed hostile environment (nuclear interceptor output) definition for reentry body upgrade program.
- Began to develop and apply modern ground shock phenomenology prediction tools and validation databases for Deeply Buried Targets.
- Generated nuclear weapons output from threat weapons (Red Book) using high-performance computers.
- Provided Source Region Electromagnetic Pulse Targeting Application (SREMPTAPS) version # I tool and Nuclear Electromagnetic Pulse Vulnerability Number (EMPVN) Wizard tool to Strategic Command (STRATCOM) for Strategic Target Analysis.
- Provided High Altitude Electromagnetic Pulse Targeting Application (HEMPTAPS) version#5 to STRATCOM for wide area High Altitude Electromagnetic Pulse (HEMP) Targets Analysis together with a Electromagnetic Pulse (EMP) Battle Engagement code architecture for quick analysis of electrically connected targets all at once, estimating their kill probability from a single strike.
- Provided technical briefings to AWE UK on HEMPTAPS and SREMPTAPS Physics algorithm to enable scientists at AWE to include UK weapon information in the matrix of the two US tools under the auspices of the JOWOG-43 for Nuclear Weapons Effects (NEW) Analysis.
- Completed the Initial Operational Capability (IOC) of the STRATCOM C4 Assessment Toolset (STRATCAT) for STRATCOM/J6 and Battle Staff/J3
- Analyzed the target response of three Russian Electromagnetic-Weapons, RANES-E, ROSA-E and NAGIRA claimed to be more lethal than a Nuclear E- Weapon for Air Defense Systems. These are sold in the open weapon markets all over the world.
- Provided support to STRATCOM in the field of nuclear phenomenology and associated tools to include upgrade to the Integrated Nuclear Computational Aids, development of an Electromagnetic Pulse (EMP) Vulnerability Number Engagement Tool, and responding to questions on space and EMP environments.
- Provided High-Altitude Nuclear Effect (HANE) and prediction tools data for the National Missile Defense Program.

FY 2003 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Hazard Prediction and Assessment Capability (HPAC)/Consequence Assessment Tool Set (CATS)	16.3	Realigned		

FY 2002 Accomplishments

- Delivered HPAC 4.0.1 to JFCOM, STRATCOM, EUCOM and other Combatant Commands and service organizations. Incorporated improved radiological dispersal devices model.
- Delivered HPAC-CATS (Nuclear) prototype for testing to STRATCOM.
- Delivered Consequence Assessment Tool Set-Joint Assessment Catastrophic Events (CATS-JACE) web-based consequence assessment software to JFCOM and other combatant commands, adding 3-D, high-explosive capability.
- Developed initial high-resolution weather forecasting model to incorporate mesoscale methodologies from the Navy, Air Force, Colorado State University, and DTRA.
- Continued development of urban transport and dispersion modeling capability through collaboration with the United Kingdom.
- Provided counter-terrorism support and urban transport and dispersion modeling capability for joint DoD/DOE support during designated special events.
- Provided consequence assessment products associated with Operations Noble Eagle and Enduring Freedom, as well as, supporting a dramatic increase in requests from the warfighter for WMD/analysis information.

FY 2003 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602715BR	**PROJECT NAME AND NUMBER:** Project BD - Weapon Effects Technologies

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Advanced Systems and Concepts Office	9.1	Realigned		

FY 2002 Accomplishments

- Commissioned and performed a wide array of study efforts that addressed areas of force protection and operations; homeland defense and countering terrorist attacks; strategic issues; and other unconventional threats and vulnerabilities.
- Completed studies on a chemical weapon next generation agent assessment; assessed casualties for a multilayer biological defense; conducted game theory applications to offense-defense strategies; continued studies of advanced chemical and biological threats and operations in contaminated environments; and further developed the conceptual plan for an integrated national bio-forensics capability.
- Assessment of broad-spectrum WMD intelligence collection gaps and needs.

FY 2003 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Infrastructure	7.8	Realigned		

FY 2002 Accomplishments

- Provided for payment of civilian salaries.

FY 2003 Plans

- Funding and activities realigned to Project BD in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to O&M.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Zebra-Chip	10.0	Realigned		

FY 2002 Accomplishments

- Validated bio surveillance software/network point-of-care capability.
- Demonstrated PCR-based initial operational capability for point-of-care pathogen detection.
- Developed and demonstrated DNA-based multi-agent biological detection chip.
- Developed and demonstrated anti-body-based multi-agent biological detection chip.

FY 2003 Plans

- Funding ended in FY 2002.

FY 2004 Plans

- Funding ended in FY2002.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: Over $11 million of FY 2002 funds have been obligated with Science Application Inc., at various locations on multiple actions. All work supports the Weapons Effects Technology program.

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602715BR	**PROJECT NAME AND NUMBER:** Project BE – Testing Technologies and Integration

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BE – Testing Technologies and Integration	10.1	Realigned	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

- This project provides a unique national test-bed capability for Weapons of Mass Destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat for various types of test/demonstration functions in response to operational needs. The project develops, provides and maintains test-beds used by the DoD, the Services, the Combatant Commands 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. These test beds also develop and provide technologies for defeat of WMD.
- This project leverages over fifty years of testing expertise to investigate weapons effects and target response across the spectrum of hostile environments that could be created by proliferant nations or terrorist organizations with access to advanced conventional weapons or WMD (nuclear, biological and chemical). Specific programs supported by this project include: (1) Hard Target Defeat (HTD); (2) Anti-terrorism (AT); (3) Counterproliferation (CP) Counterforce Advanced Concept Technology Demonstration (ACTD); and (4) Special Operations Forces (SOF). This project maintains testing infrastructure and expertise to support warfighters, other government agencies, and friendly foreign countries testing requirements on a cost reimbursable basis.
- This project also develops strategy and planning for a WMD test-bed infrastructure focusing on nuclear, biological, and chemical facilities, and the hard and deeply buried facilities in which activities are often located. The project provides support for full and sub-scale tests that focus on weapon-target interaction with fixed soft and hardened facilities to include aboveground facilities, cut-and-cover facilities and deep underground tunnels. Specific activities include testbed design and construction, instrumentation and data collection, test coordination and execution, and post-test analysis and documentation. This project directly supports Projects BC, BD, and BF, and, in PE 0603160BR, Project BJ and BK.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Test-Bed Operation and Support	8.1	Realigned		

FY 2002 Plans

- Continued to provide unique national test-bed capabilities for weapon-target interaction and WMD programs. Expect to support 5 major Second Counterproliferation (CP2) ACTD demonstrations, 15 Hard Target Defeat demonstrations, 6 antiterrorism information tests and 10 general phenomenology tests.
- Provided an inventory of unique targets, infrastructure support, and expertise for conduct of major integrated test programs, including instrumentation maintenance, gauge installation, data recording, source diagnosis, environmental support, safety support, experiment installation, experiment fielding, and test fielding.

FY 2003 Plans

- Funding and activities realigned to Project BE in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BE in PE 0602716BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Field Support	1.4	Realigned		

FY 2002 Accomplishments

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

FY 2003 Plans

- Funding and activities realigned to Project BE in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BE in PE 0602716BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Simulator Technology	.6	Realigned		

FY 2002 Accomplishments

- The Large Blast Thermal Simulator Facility test area was used for two explosive tests to validate protective structure designs.
- Maintained Large Blast Thermal Simulator (LB/TS) in a caretaker status, which included one systems test to assure the operational status of the device.
- Began modification of the driver tube section for removal of hydro plugs.

FY 2003 Plans

- Funding and activities realigned to Project BE in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BE in PE 0602716BR.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602715BR	**PROJECT NAME AND NUMBER:** Project BF – CP Operational Warfighter Support

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BF – CP Operational Warfighter Support	64.1	Realigned	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

- This project will provide targeting and Intelligence Community (IC) support, exercise Counterproliferation (CP) technologies and products with the users, develop DoD compliant simulations that exploit CP models for target planning and collateral effects prediction, and demonstrate CP capabilities in operationally realistic environments. The technical approach is to integrate technologies developed in other CP 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 CP technologies into customer operations, and to support use of these capabilities during contingency operations. This project focuses on three thrusts that support outside customer requirements. The three thrusts are: 1) Hard Target Defeat (HTD) program, 2) Operational Support Technology, and 3) Combatant Commanders Planning Support. The CP Operational Warfighter Support project provides the bridge between the CP technology base and operational community needs. The overall project goal is to support the Joint Chiefs of Staff (JCS), the Combatant Commanders and Services/agencies engaged in countering Weapons of Mass Destruction (WMD) threats and to protect the U.S. and its allies against military or terrorist use of WMD.

- **Operational Support Technology.** The Weapons of Mass Destruction Assessment and Analysis Center (WMDAAC) provides the warfighter with the capabilities and understanding for countering the use and effect of WMD through the advancement of simulation technology, assessment of operational impact, development of collaborative capabilities and access to mature computer models. Specifically: (1) WMDAAC develops advanced simulations from first-principles physics models produced in other projects in this program element (extensively Project BD). WMDAAC personnel provide an interface between DTRA model developers and the weapons effects simulation community to ensure maximum utility of DTRA models in distributed interactive simulations through compliance with Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) & High-Level Architecture (HLA) standards and protocols documented in Federation Object Models. (2) WMDAAC uses these advanced simulations to assist the warfighter in quantifiably assessing operational theater plans and post-attack warfighting effectiveness and to develop alternatives to mitigate the effects of WMD. (3) WMDAAC develops and adapts capabilities to project information through advanced visualization techniques and advanced collaboration at widely dispersed locations including Combatant Commanders. Commercial and government-developed technologies are selected and proven in a research environment, and then transitioned to the DTRA Operations Center and/or other warfighter customers. (4)WMDAAC provides warfighters and first responders with ready access to mature computer models, WMD databases and expert field assistance and training. The end result is to provide more realistic models and simulations of the effects of WMD for use in training, analysis, experimentation, operational environments and acquisition. In FY 2004, the WMDAAC will begin the development of a Weapons of Mass Effect (WME) Battle Laboratory. The WME Battle Lab is a natural "next step" in the evolution of WMDAAC's simulation and collaboration technology development activities combined with its operations research capability into a resource which will enable the warfighter to better understand the effects of WME and refine concepts of operation and battle plans.

- **Hard Target Defeat Program.** The United States and its allies face a growing threat related to critical military targets hidden within and shielded by hardened, deeply buried tunnel complexes. These complexes may house biological/chemical/nuclear weapons production or storage facilities; command, control, and communications facilities; and theater ballistic missiles and their transporter-erector-launchers (TELs). An objective of this project is to examine the existing U.S. and Allied capabilities to hold hardened, deeply buried tunnel targets at risk, thereby defining a current performance baseline. Any deficiencies will be identified and the ability of planned systems to address these deficiencies will be assessed. Finally, new technologies needed to mitigate remaining shortfalls will be evaluated as candidates for new hard target defeat acquisitions. Activities respond to warfighting requirements derived from the Hard and Deeply Buried Target Defeat Capstone Requirements Document, and to the RDT&E priorities of the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD(AT&L)). Funds added as a result of the Secretary of Defense strategic review for FY 2002 are being used to develop technologies identified in the Hard and Deeply Buried Target Defeat Science & Technology Plan.

  - Targeting and IC Support, part of Hard Target Defeat, provides functional vulnerability assessments of hostile foreign systems in support of warfighter and IC requirements. It assists the Combatant Commanders and IC in target planning against hard and deeply buried facilities. The assessments leverage databases, methodologies, and technical expertise developed during Balanced Survivability Assessments (PE 0602715BR, Project BC). Details of specific individual assessments are classified.

  - This project focuses weapon/target interaction and target planning tool technology base efforts completed in Project BD on tunnel applications. The program depends on test planning and execution support from Project BE. Products from this project are transitioned to PE 0603160BR, Project BK for Command, Control, Communications, and Intelligence (C3I) facility demonstration and the Thermobaric Weapon (TW) demonstration. Efforts in this program provide part of the technology base needed for counterproliferation activities conducted in other DoD programs.

- **Combatant Commander Planning Support.** This activity develops modeling and simulation tools and applies them to support the warfighter in development of war plans. Theater and campaign level simulation and modeling tools are also being developed and produced. The War Planning Support (WPS) program is used to assess/analyze war plans or to evaluate the benefits of new technology on improved warfighter efficiency and effectiveness. Two tools currently being developed for theater and campaign level simulation and modeling are the Integrated Theater Engagement Model (ITEM) and the Synthetic Exercise Environment (SEE).

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Hard Target Defeat Demonstrations	16.5	Realigned		

FY 2002 Accomplishments

- Completed installation of equipment necessary for functional defeat demonstrations on the C3I tunnel facility #2 at Nevada Test Site (NTS).
- Conducted simulated C3I operations at the NTS tunnel facility #2 to support signature/sensor evaluations.

- Initiated functional defeat demonstrations using advanced weapon concepts on the C3I tunnel facility #2 at NTS.
- Started construction of tunnel portal test facilities at White Sands Missile Range (WSMR) to evaluate operational tactics and standoff weapon systems prohibited at NTS.

FY 2003 Plans

- Funding and activities realigned to Project BF in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BF in PE 0602716BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Hard Target Defeat Technologies	34.8	Realigned		

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FY 2002 Accomplishments

- Continued development and validation of remote site geologic characterization technology.
- Developed functional characterization models of C3I and WMD tunnel facilities.
- Identified mission critical equipment and vulnerabilities for WMD tunnel facilities.
- Continued penetration testing for rock and damaged concrete focusing on multiple attacks on the same aimpoint.
- Continued advanced weapon/payload testing to identify/quantify defeat mechanisms and evaluate effectiveness for C3I and WMD tunnel facilities.
- Conducted development and lethality testing of a classified weapons concept for C3I tunnel facilities.
- Developed improved weapon/target interaction models to include the response of critical C3I and WMD equipment to advanced payload environments.
- Continued support for other DoD and military service hard target defeat-related activities.
- Developed structural and functional battle damage assessment for C3I and WMD tunnel facilities, for incorporation into the Munitions Effects Assessment (MEA) tunnel module.
- Continued evaluation of signatures for hard target defeat applications.

- Initiated development of a functional defeat capability to assure critical component and network centric kills for targets invulnerable to physical defeat.
- Assessed ground shock and tunnel blast lethality issues to determine minimum collateral effects application of nuclear weapons against hard targets.
- Initiated development of an advanced payload for improved lethality to address hard and deeply buried target problem.
- Initiated development of high-payoff novel explosive concepts using advanced energetic materials to enable defeat of targets currently invulnerable to weapons solutions.
- Accelerated development of a thermobaric payload optimized for hard and deeply buried targets and WMD agent kill applications.
- Continued targeting and intelligence community support by conducting assessments of hostile facilities based on JCS and Combatant Commanders priorities. Details are classified.

FY 2003 Plans

- Funding and activities realigned to Project BF in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BF in PE 0602716BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Operational Support Technology	8.1	Realigned	0	0

FY 2002 Accomplishments

- Delivered 90+ man-days in Post-9/11 Weapons of Mass Effect (WME) support (Operation Noble Eagle) with threat projection/analysis and contingency planning.
- Demonstrated and employed federated WME tools to help accomplish targeting and battle damage assessments (BDA) during congressionally directed Millennium Challenge (MC02) and other exercises.
- Provided web-enabled Weapons Analysis Lethality Tool Set (WALTS) capability for reachback support and advanced collaboration at USEUCOM's Enabled Freedom '02 exercise in the Warrior Preparation Center. WALTS provided physics-based weapons/target interaction and 3-D visualization to assist the commander in mission planning and real-time (virtual) battle damage assessment (BDA).

- Delivered Phase I High-Level-Architecture-compliant WMD Operational Assessment Model (Integrated Theater Engagement Model plus Hazard Prediction and Assessment Capability) to U.S. Forces Korea.
- Established WME Operations Research Cell for operational concept analysis (sensor placement, novel weapons, etc.), acquisition strategies, and military utility assessments of emerging technologies.
- Continued joint efforts to develop high-fidelity, physics-based models and databases of targets, weapons, and post-strike effects that support real/near-real time viewing of dynamic weapons effects in a simulated environment to include the effects of WMD, conventional weapon effects, and 3-D visualization of weapon/target interaction.
- Accelerated research and development of collaborative tools through involvement with ACTDs (Combatant Commanders 21, Coalition Combatant Commanders 21, HLS C2). Leveraged emerging technologies to ensure compatibility with a wide range of customers (warfighter, federal, state, and local governments) using advanced communication and knowledge management technologies.
- Utilized exercise and wargame participation to educate warfighters and test new concepts and tools (Combatant Commanders 21 ACTD, Fleet Battle Experiments, Ulchi Focus Lens, MC-02 and Joint Land, Air, and Sea Simulation and Strategic Crisis Exercise).
- As a principal stakeholder in the Homeland Security CP2 ACTD, participated in interagency development and demonstration of stand-alone tools and collaboration technologies for dealing with the consequences of terrorist acts, industrial accidents and natural disasters.

FY 2003 Plans

- Funding and activities realigned to Project BF in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BF in PE 0602716BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Combatant Commander Support	4.7	Realigned	0	0

FY 2002 Accomplishments

- Produced Synthetic Exercise Environment (SEE) database and cartographic products for AIMING FIST 2002 exercise.
- Completed War Planning Support (WPS) to Supreme Headquarters Allied Powers Europe (SHAPE).

- Continued WPS analytical support to the Commanding General 32nd AAMDC with completion of newly integrated Theater Missile Operations Campaign Plan Methodology for USFK/CFC, and transitioning applications to USFK and USCENTCOM Area of Responsibility (AOR) requirements.

FY 2003 Plans

- Funding and activities realigned to Project BF in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BF in PE 0602716BR.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602715BR	**PROJECT NAME AND NUMBER:** Project BG – Nuclear Operations

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BG – Nuclear Operations	135.0	Realigned	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

- These programs directly reflect the National Military Strategy, support the provisions of Joint Vision 2020, and are directed by the JCS in the Joint Strategic Capabilities Plan (JSCP) Nuclear Annex. This project has been reorganized into three activities: 1) Nuclear Programs, 2) Combatant Commands/Forces/Security Support and 3) a new activity--WMD (Nuclear) Protection and Response. Responsive to the oversight of the Nuclear Weapons Council, they provide critical support to the Combatant Commands, Services, JCS and OSD. This project continues the realignment begun by DTRA at its inception so as to deal with the emerging 21st Century strategic landscape, and is divided into the three areas as described above:

- **Nuclear Programs** . Nuclear Weapons Surety: As tasked by the DoD Nuclear Weapon System Safety Program, the surety programs will provide Combatant Commands, Services, and JCS with technical analysis, studies, research, and experimental data to identify and quantify risks of plutonium dispersal and Loss of Assured Safety (LOAS) due to accidents, fires or natural causes during normal, peacetime operations of the nations nuclear weapon systems. Additionally, studies to quantify the probability of success of targeted terrorist attacks on DoD facilities, leveraging these risk assessment advances.
  - Nuclear Mission Management Plan (NMMP): As tasked by Deputy Secretary of Defense and Director, Defense Research and Engineering (DDR&E), and in support of national requirements to maintain a strategic nuclear deterrent, conduct assessments and develop long-range plans, the continued development of the DoD Nuclear Mission Management Plan is designed to provide a comprehensive, integrated DoD roadmap for the sustainment and viability of U.S. nuclear forces, personnel, and infrastructure.
  - Stockpile Sustainment: Continue to act as DDR&E's Executive Agent for Annual Certification and Dual Revalidation and support related stewardship and sustainment activities.
  - Stockpile Operations Support: In support of national requirements to maintain a viable nuclear deterrent, this program provides automated tools to maintain, report, track and highlight trends affecting the nuclear weapon stockpile. It will provide crucial business process and information support to ensure continued sustainability and viability of the nuclear stockpile.

- **Combatant Commands/Forces/Security Support.** As tasked by the JSCP and DoD Directives, these programs will provide Combatant Commands, Services, JCS and DoD with focused analyses in support of nuclear planning and operations and WMD threat mitigation as they pertain to the combat survivability of the forces. Additionally, they provide the DoD nuclear physical security applied research and force-on-force (FoF) testing programs to help insure the security of our nuclear forces. Provides technical support and curriculum development and enhancement for the Defense Nuclear Weapons School (DNWS), to include other WMD support, and other DoD nuclear training activities.

- **WMD (Nuclear) Protection and Response.** As a new activity and in direct support to the National Military Strategy, these programs will promote initiatives to detect the surreptitious introduction and use of weapons of mass destruction against the U.S. and its allies thereby protecting our citizens and critical infrastructures. Potential adversaries, whether nations, terrorist groups or criminal organizations, will be tempted to use asymmetric means

of war such as WMD to counter U.S. conventional weapon superiority. Promoting such initiatives enhances deterrence and proactively supports the agency's mission of WMD threat reduction.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Nuclear Programs	18.0	Realigned		

FY 2002 Accomplishments

- Nuclear Weapon Surety Thrusts:
  - Continued the B-2 Weapon Safety System Assessment (WSSA).
  - Completed Storage Vault Blast Effects Testing and Analysis.
  - Performed a classified safety study of a DoD nuclear facility.
  - Initiated a weapon safety lightning protection workshop.
  - Conducted a review of explosives safety analysis model.
  - Completed the validation of the Storage Facility (Lightning) Tester.
  - Continued the development and population of the "Nuclear Surety Information Center," a weapon safety database of completed assessments, studies, and test programs.
  - Continued Phase II Small Business Innovative Research (SBIR)– Automated Vulnerability Evaluation for Risks of Terrorism (AVERT) and Isis Fire Modeling Program.
- Stockpile Sustainment Program Thrusts:
  - Supported annual certification and stockpile stewardship for the continued safety and reliability of the U.S. nuclear stockpile in the absence of undergroundtesting.
  - Performed assessments and provided support to the Nuclear Posture Review and End-to End Review.
  - Continued the "Nuclear Deterrent Support Program".
  - Supported development of the Nuclear Weapons Stockpile Plan and the Requirements & Planning Document.
  - Developed "Outreach 21" for nuclear expertise support to operational units.

- Prepared an annual performance report, as directed by Presidential Decision Directive #15(PDD), on the DoD stockpile sustainment accomplishments and future plans.
- Provided technical support to the Nuclear Weapons Council (NWC) and Joint Advisory Committee on Nuclear Weapons Surety (JAC).
- Prepared FY 2003 Edition of the NMMP.

- Stockpile Operations Thrusts:
  - Developed and implemented the Defense Integration and Management of Nuclear Data Services (DIAMONDS) capability package 2, which included additional enhancements to Maintenance Bay and Unsatisfactory Reporting System modules, initial Joint Nuclear Weapons Publication System (JNWPS) online access to pubs, as well as, fielded additional integrated modules based upon user priorities and feedback while continuing to enhance fielded modules. Linked 4 CONUS nuclear storage sites with secure communications to support DIAMONDS data transmission and access to stockpile information, tools, and data. Performed OCONUS exploratory visits for unique site requirements. Performed Joint Application Design for Electronic Inspection Record Cards (IRC) and Weapon Information Reports (WIR). The Special Weapons Information Management (SWIM) system also was integrated in this FY.

FY 2003 Plans

- Funding and activities realigned to Project BG in PE 0602717BR and Project BG in PE 0602716BR.

- **FY 2004 Plans**
- Funding and activities realigned to Project BG in PE 0602717BR and Project BG in PE 0602716BR.

Cost ($ in thousands)	FY 2002	FY 2003	FY 2004	FY 2005
Combatant Command/Forces/Security Support	7.8	Realigned		

FY 2002 Accomplishments

- Maintained USEUCOM/SHAPE European Theater Nuclear Support Program to provide in-theater nuclear and WMD support to EUCOM and NATO.
- Jointly with the CP Directorate, continued the War Plans Support Program for the Combatant Commands. Objective is to provide operational analyses dealing with theater WMD planning issues supporting the development of Combatant Command CONOPS, CONPLANS and OPLANS.

- Continued support to STRATCOM and regional Combatant Commands with specific nuclear and WMD threat analyses in support of Single Integrated Operational Plan (SIOP) preparation, development of integrated effects models, direct planning support to regional Combatant Commands, and specified applications for the Deterrence Framework analytic structure.
- Continued to execute the Strategic Deterrence Program to support full range of nuclear and WMD Consequence Management Issues, provide nuclear policy support and the assessment of the full range of nuclear/WMD issues for DoD components.
- Completed targeting program to fully integrate the planning processes and target data set of STRATCOM, regional Combatant Commands plans and NATO nuclear planning capability.
- Conducted Force-on-Force exercise program focused on U.S. forces in USEUCOM/USAFE using the Mighty Guardian series.
- Completed support of the Air Force Space Command (AFSPACECOM)/STRATCOM security analyses of ICBM forces.
- Plan to support potential Mighty Guardian Exercise.
- Initiated new program to examine and evaluate the future impacts of technology on political/military/economical trends-focused on WMD/Consequence Management
- (CM)/Nuclear proliferation.
- Completed NATO Nuclear C2, Quadrennial Defense Review Analytical Support program.
- Continued to directly support the curriculum development for the Defense Nuclear Weapons School
- Continued to serve as the DoD Executive Agent for nuclear weapons training and education.
- Began development of a comprehensive WMD Training program.
- Continued to expand and enhance expertise outreach training program across DoD.

FY 2003 Plans

- Funding and activities realigned to Project BG in PE 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BG in PE 0602717BR.

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602715BR	**PROJECT NAME AND NUMBER:** Project BG – Nuclear Operations	

Cost ($ in thousands)	FY 2002	FY 2003	FY 2004	FY 2005
WMD (Nuclear) Protection and Response	16.8	Realigned		

FY 2002 Accomplishments

- Continued development of tools and capability for rapid attribution of the source of a nuclear event under the "Domestic Nuclear Event Attribution " (DNEA) program.
- Developed a portable, mobile, and rapidly deployable radiation detection and tracking system.
- Developed a multi-platform system to replace the current mobile/aerial/maritime unit.
- Developed satellite communication architecture for rapid data exfiltration.
- Developed new handheld radiation detection equipment.
- Started worldwide equipment replacement and modernization.
- Created the Direct Support Team (DST) to provide WMD support to Combatant Commanders.

FY 2003 Plans

- Funding and activities realigned to Project BG in PE 0602716BR.

FY 2004 Plans

- Funding and activities realigned to Project BG in PE 0602716BR.

Cost ($ in thousands)	FY 2002	FY 2003	FY 2004	FY 2005
Classified Program	92.4	Realigned		

FY 2002 Accomplishments

- $92.4M was reprogrammed in year of execution to fund a classified program.

FY 2003 Plans

- N/A

FY 2004 Plans

- Funding and activities realigned to Project BG in PE 0602716BR.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers : Over several actions a total of $80 million of FY 2002 funding was obligated with the U.S. Department of Energy in support of a classified program.

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602715BR	**PROJECT NAME AND NUMBER:** Project BH – System Survivability

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BH – System Survivability	75.6	Realigned	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

- These programs directly reflect the National Military Strategy, support the provisions of Joint Vision 2020 and the Nuclear Posture Review, and are directed by the JCS in the Joint Strategic Capabilities Plan (Nuclear Annex). 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; 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.
- FY 2002 reflects an addition of $17M, which resulted from the Secretary of Defense strategic review that stressed the importance of developing technological solutions to critical defense problems including ensuring the availability of radiation hardened microcircuits for survivable military systems, enabling the survivability of critical nuclear command and control networks, space surveillance systems, and missile system upgrades.

- **Radiation Hardened Microelectronics.** Responds to DoD space and missile system requirements for hardened microelectronics and photonics technology to support mission needs. The non-availability of this technology would adversely impact system survivability, performance, weight and cost. The program involves the development and demonstration of radiation-hard, high performance prototype microelectronics to support the fabrication of radiation-hardened microcircuits and photonics for DoD missions through private sector and government organizations. This is achieved through the development and demonstration of enabling technologies to ensure the continued availability of special materials and radiation-hardened prototype microcircuits and photonic devices.

- **Simulator Technology.** This program is being revised to respond to the Defense Science Board Task Force on Nuclear Effects Simulation that recommended that DTRA pursue developing some of the capability lost with the moratorium on underground testing. Since the underground testing (UGT) moratorium, simulators have provided the only remaining experimental test bed for the development and validation of radiation-hardened DoD systems. The intensity and fidelity of these simulators do not match that of the UGT testbed, but, through this program, the agency develops, provides and maintains unique DoD radiation test facilities and enabling technologies that are used by the Defense Agencies, the Services and other federal departments (such as DOE) to evaluate the impact of hostile environments on military systems that support missions in the air, on land, at sea, or in space. The program also develops technologies to improve the intensity, fidelity, reliability, reproducibility, and cost effectiveness of existing and future simulators (including radiation sources, power flow and conditioning components, energy storage, diagnostics, instrumentation, other test

support equipment, debris shields, and numerical models and computer codes for radiation sources and pulsed power components and test beds); develops concepts, plans, and risk reduction strategies for affordable next-generation radiation simulators with substantially improved intensity and fidelity; support improvements to the two existing test centers, one at Titan Pulsed Sciences Division in San Leandro, California, and one at the Arnold Engineering Development Center (AEDC) in Tullahoma, Tennessee; and installs and characterizes upgrades to the new Decade x-ray simulator and to existing radiation simulators at Titan.

- **Assessments and Protection Technology.** Directly responds to warfighter and acquisition program survivability needs by providing radiation hardening solutions, including development of emerging technologies and methodologies for system-level and family-of-system-level assessments, systems hardening, and testing of the effects of nuclear weapons. Includes development and demonstration of cost-effective system design and test qualification techniques to produce hardware that can be tested without the need for underground nuclear tests. Provides testable system design protocols, design and assessment toolkits, and modeling and simulation (M&S) tools for program managers, system designers and users of nuclear effects simulators.

- **Balanced Electromagnetic Hardening.** Provides the necessary science and technology to develop warfighting systems and DoD mission-related infrastructure survivable in multiple electromagnetic (EM) environments, including nuclear electromagnetic pulse (EMP) and high power microwaves. Designs and develops innovative low-cost balanced EM protection, test technologies for weapon systems, C3, and support infrastructure systems to the Combatant Commands, Services and other DoD agencies.

- **Human Risk and Technology.** Applies lessons learned from the Nuclear Test Personnel Review Program (O&M-funded) to allow warfighters and peacekeepers to quantify/mitigate the risk in post-Cold-War settings (i.e., limited nuclear exchanges, terrorist actions, radiological dispersal weapons, and other radiation risk scenarios) by developing field measurement and dosimetry systems to support military radiological guidelines for the protection of human resources. This provides direct support to warfighters by predicting and quantifying the operational impact of nuclear, biological and chemical (NBC) and conventional battlefield soldier effectiveness on NBC battlefields; providing performance and cost analysis to support the Defense Acquisition Board; and joint efforts with system program offices to apply the Agency's expertise and technologies to specific Service applications.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Radiation Hardened Microelectronics	40.6	Realigned		

FY 2002 Accomplishments

- Demonstrated 16M multi-chip module static random access memory.
- Developed the initial technology base to support the demonstration of radiation hardened very deep submicron microelectronics integrated circuits as part of the USD(AT&L) accelerated radiation hardened microelectronics technology roadmap.

- Demonstrated radiation hardened 0.25-micron complementary metal oxide semiconductor/bulk and silicon-on-insulator technology for low-power microelectronics.
- Demonstrated functional, integrated electronic design automation for deep submicron technologies.
- Initiated the process development of a radiation-hardened cryogenic readout circuit.

FY 2003 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Simulator Technology	17.5	Realigned		

FY 2002 Accomplishments

- Supported customer test requirements at DTRA test facilities.
- Exceeded goal set for cold x-ray yield improvements at Decade by 40%.
- Demonstrated over 300 kilojoules (KJ) Ar Plasma Radiation Source (PRS) on the Sandia Z machine.
- Continued development of cold x-ray sources with improved yield for other simulators, leading to factor-of-two improvement in yield.
- Continued diagnostics development for user test support and for source development.
- Continued radiation magnetohydrodynamic modeling and simulation.

FY 2003 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Design and Assessments Technology	8.5	Realignment		

FY 2002 Accomplishments

- Continued to modify the Electronic Battle Book (EBB) database to include multiple link assessment due to nuclear weapons detonation for USSPACECOM exercises and assessments.
- Continued Missile Defense Agency/Ground Based Midcourse Defense (MDA/GMD) requirements development support for version C1 of the GMD initial capability.
- Continued MDA/Navy Shipboard Midcourse Defense (SMD) requirements development support.
- Completed development of flexible network assessment tool for analyzing various nuclear weapons effects on system performance.
- Initiated USSPACECOM operability assessment of Tactical Warning/Attack Assessment (TW/AA) system considering impacts of future GMD system integration.
- Completed development of the Wideband Channel Simulator.
- Supported GMD Hardware-in-the-Loop (HWIL) testing.
- Started development of a Visible Display Simulator to support Spaced Based Infra-Red Systems (SBIRS) Low testing and other future customers.
- Supported GMD In-Flight Information Control System (IFICS) testing.
- Developed nuclear environment software modules for integration with HWIL facilities.
- Conducted testing of EWRs in support of GMD program upgrades. Developed radar disturbance mitigation techniques for GMD, Ground Based Radar (GBR) and Early Warning Radars (EWRs).
- Provided Infrared (IR) scene testing of MDA (Missile Defense) sensors.
- Supported IR testing of Space-Based Infrared Satellite (SBIRS).
- Continued communication/radar atmospheric effects participation in operational/warfighting exercises through operational assessments.
- Completed development of subsystem controller microcircuitry for fast circumvention and recovery (C&R) after radiation exposure.

- Delivered Testable Hardware Toolkit Version 2.0
- Began development of a thermostructural response (TSR) toolkit.
- Applied System Hardening Upset and Recovery macrocell library to radiation exposure of the Global Positioning System (GPS) for rapid recovery. Demonstrated fast recovery of the GPS clock.
- Sensor Hardening Technology continued to evaluate hardening techniques for current state-of-the-art focal plane arrays.
- Continued development of nuclear effects keepout algorithms for the GMD Battle Management System.
- Continued to assess the survivability of the GMD Communications Network (GCN) and GMD ground facilities.
- Initiated Next Generation Network (NGN) Hard-ware-in-the-loop testbed study of the GCN.
- Started development of Operability Assessment Tool for Systems (OATS).

FY 2003 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Balanced Electromagnetic Hardening	8.0	Realignment		

FY 2002 Accomplishments

- Developed Mission Degradation Analysis (MIDAS) interim software prototype extraction tool for application to existing infrastructure databases.
- Developed Radio Frequency (RF) Circuit Protection theory to predict the effect of transformed, coupled signals on military critical circuits.
- Developed theoretical approaches for hardening circuit components against emerging high power RF weapons threats.
- Developed integrated Electromagnetic (EM) protection measures/technologies for battlefield systems.
- Began activity to update MILITARY-HANDBOOK-423, HEMP Protection for Fixed and Transportable Ground Base C4I Facilities.
- Integrated the substrate protection technology into existing COTS/Non Developmental Items (NDI) and MILSPEC equipment to demonstrate its effectiveness in protecting sensitive receivers from powerful RF attacks.

FY 2003 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Human Survivability	1.0	Realignment		

FY 2002 Accomplishments

- Continued development and evaluation of radiation protection standards and risk measures applicable to personnel/equipment for US Armed Forces, NATO and The Technical Cooperation Program (TTCP) review.
- Provided U.S. Representative to newly formed TTCP Action Group forty-eight on low-level radiation.
- Successful testing of UAV-based radiological measurement package conducted in UAV's and Helicopter using sealed radioactive sources and flights over actual contaminated site under remediation.
- Commenced Electro-Paramagnetic Resonance Mobile Response Dosimetry System for forward deployed battlefield assessment of personnel exposure to ionizing radiation using human teeth in-situ.
- Orchestrated provision of fixed electron paramagnetic resonance (EPR) Forensic Laboratory to be used by the Uniformed University of the Health Sciences (USUSH) and the Armed Forces Radiobiological Research Institute (AFRRI) for use in analyzing tissue samples (teeth, dentin, and bone) for assessment of radiation exposure to deceased individuals.
- Commenced Development and Construction of Rolling Circle Amplification (RCA) based hand-held Radiological Biodosimeter for forward deployed battlefield assessment of personnel exposure to ionizing radiation from human blood.
- Provided support to National Council on Radiation Protection and Measurements and to the NAS/EPA BEIR VII (Biological Effects of Ionizing Radiation) analysis to be completed FY 2003 as well as studies of possible terrorist use of radioactive materials.
- Facilitated the adaptation and integration of human response and behavioral representations into appropriate agency and outside agency programs.

FY 2003 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

FY 2004 Plans

- Funding and activities realigned to Project BH in PE 0602717BR.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: Over $18 million of FY 2002 funding has been obligated with Mission Research Corp., at various locations on multiple actions. All work supports the mission of the System Survivability program.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** WMD Defeat Technology; 0602716BR

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total 0602716BR Cost	**0**	**162.3**	**183.2**	**247.9**	**256.5**	**258.1**	**255.5**	**259.0**
Project BB Small Business Innovative Research	0	1.9	2.0	1.8	1.9	2.0	2.0	2.1
Project BD Weapons Effects Technologies	0	83.3	62.2	69.0	76.7	78.5	79.5	81.0
Project BE Testing Technologies & Integration	0	11.3	12.0	12.1	12.4	12.5	12.7	13.0
Project BF CP Operational Warfighter Support	0	50.6	44.9	96.0	101.5	101.1	102.3	103.9
Project BG Nuclear Operations	0	15.2	62.1	69.0	64.0	64.0	59.0	59.0

A. Mission Description and Budget Item Justification:
The mission of the Defense Threat Reduction Agency (DTRA) is to safeguard America and its friends from weapons of mass destruction (WMD) by reducing the present threat and preparing for the future threat. This mission directly reflects the National Military Strategy, supports the provisions of Joint Vision 2020 and is specifically directed by the JCS in the Joint Strategic Capabilities Plan (Nuclear Annex). To achieve this mission, DTRA has identified principal objectives along with strategies and tasks to ensure the objectives are met. Three of these objectives are to deter the use of WMD, reduce the present threat and prepare for the future threat. A focused, strong threat reduction technology base is critical to achieving these objectives. DTRA has taken the steps to develop this technology base.

This budget submission provides the essential technologies to deter the use of WMD and prepare for the WMD threat. It includes manpower authorizations, special equipment, necessary facilities, test bed operations, and all other associated costs in support of the development of the technology base needed to support the defeat of current and future WMD. Initiatives supported include, but are not limited to, such activities as follow:

- Counterproliferation (CP) programs providing capabilities to warfighters through the development of:
  - consequence assessment technologies and tools,
  - WMD operational support technologies, and
  - targeting support capabilities.
- Technology input to support the development of WMD training courses responsive to emerging threats and technological challenges.

CP technologies to include antiterrorism will help DTRA prepare for the WMD threat and support civil and military response to WMD use.

The DTRA is the DoD focal point for programs and activities to reduce the threats posed by WMD proliferants. New, forward-thinking activities have been identified and prioritized to support the DTRA mission and the DoD CP strategy for responding to the full spectrum of crises and preparing now for an uncertain future. The CP programs support national guidance, the DTRA strategic vision, and Service and Combatant Command, operational customers. This program element provides the innovative technologies and concepts underpinning all CP programs.

- Examination of existing U.S./Allied capabilities to hold hardened, deeply buried targets at risk; evaluation of capabilities against known or projected potential targets; and evaluation of new technologies for possible application against known shortfalls.
- Targeting and Intelligence Community (IC) support to warfighters that provides functional vulnerability assessments of hostile foreign systems.
- Development of WMD analysis and simulation tools for the warfighter including target planning and assessment; hazardous materials transport and collateral effects prediction; consequence assessment; and anti-terrorism/force protection.
- Development and application of state-of-the-art nuclear weapons effects models to support nuclear weapon stewardship and system hardness design.
- Development, improvements and test engineering for the unique DoD test and simulation facilities (to include infrastructure) and enabling technologies that are used to evaluate the impact of hostile environments from conventional, nuclear, and other special weapons on military or civilian systems or targets.

Counterproliferation Technologies projects comprise a critical component of the ability of the Department to meet the technology challenges posed by the emerging international environment and the National Military Strategy. The coverage of the projects ranges from counter-terrorism through conventional conflict through countering WMD threats.

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

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** WMD Defeat Technology; 0602716BR

B. Program Change Summary:

($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget	**0**	**146.1**	**141.9**	**181.5**
Current President's Budget	**0**	**162.3**	**183.2**	**247.9**
Total Adjustments		**16.2**	**41.3**	**66.4**
Congressional program reduction				
Congressional rescissions		**-2.8**		
Congressional increases		**21.0**		
Reprogrammings				
Internal Transfers (DoD-Wide)		**-2.0**	**45.0**	**65.0**
Internal Transfers (within DTRA)			**-3.7**	**1.4**
SBIR/STTR Transfer				

Change Summary Explanation:
In order to better define and capture its 6.2 resources, DTRA has created two new program elements:

- WMD Defeat Technology (0602716BR)
- Strategic Defense Technologies (0602717BR).

Effective with FY 2003, specific resources associated with Projects BB, BD, BE, BF, and BG will be split from the existing PE 0602715BR and realigned to PE 0602716BR, WMD Defeat Technology.

- The overall increase in FY 2003 from the previous President's Budget is attributed to Congressional adds in the amount of $21M (+9.8M DERF-Vulnerability Reduction Tech. Measurement, +$5M DERF-Hazard Prediction & Decision Support Tools, +$2M DERF-Hard Target Defeat Characterization Initiative, +$2.1M Deep Digger, +$1.1M WMD Material Assessment, and $1M Discrete Particle Method). The FY 2003 DoD Appropriation Bill (P.L. 107-248) contained several Congressional recissions that were proportionally applied to the entire DTRA RDT&E program. This particular PE received a $2.8M reduction (-$1.3M Section 8100-Business Process Reform/Management Efficiencies, -$.3M Section 8190-Reduce Cost Growth of Information Technology Development, -$.9M Section 8135-Revised Economic Assumptions, and -$.3M Section 8029- FFRDC). The Department also implemented transfers that reduced this PE by $2M (-$.7M Retirement Accrual, and -$1.3M Inflation Adjustment).

- The increase in FY 2004-2005 from the previous President's Budget to the current President's Budget is the result of the Department's decision to provide DTRA funding for a classified program. This is not considered a new start, in that funding was previously provided in the year of execution only. Funding was also transferred from DTRA to other DoD elements as part of the revised Non Pay Purchase Inflation adjustment. The internal

transfers made by DTRA reflects a carefully balanced program focused on safeguarding America's interest from WMD by controlling and reducing the threat by providing quality tools and services for the warfighter. Accordingly, resources have been reprogrammed to support critical requirements across the spectrum of combat support, technology development, threat control, and threat reduction mission areas.

- 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.
- The FY 2004 profile reflects the internal functional realignment of personnel costs at DTRA's Albuquerque Operations site (124 civilian; 62 military personnel) from DTRA's Research, Development, Test and Evaluation, Defense-Wide account to its Operation & Maintenance, Defense-Wide account. As part of DTRA's continued effort to integrate and refine legacy functions and activities, this transfer more appropriately aligns DTRA's Albuquerque civilian and military positions and associated funding to the proper appropriation-Operation and Maintenance, Defense-Wide.

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

D. Acquisition Strategy: N/A

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602716BR	**PROJECT NAME AND NUMBER:** Project BB - Small Business Innovative Research (SBIR)

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BB – Small Business Innovative Research (SBIR)	0	1.9	2.0	1.8	1.9	2.0	2.0	2.1

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 2002	FY 2003	FY 2004	FY 2005
Small Business Innovative Research (SBIR)	0	1.9	2.0	1.8

FY 2002 Accomplishments

- Funding and activities performed in Project BB are in PE 0602715BR.

FY 2003 Plans

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

FY 2004 Plans

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

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602716BR	**PROJECT NAME AND NUMBER:** Project BD - Weapon Effects Technologies

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BD – Weapons Effects Technologies	0	83.3	62.2	69.0	76.7	78.5	79.5	81.0

A. Mission Description and Budget Item Justification:

- Provides for the development and application of products and services to meet Weapons of Mass Destruction (WMD) and other special weapon effects challenges. This is accomplished using state-of-the-art science and engineering capabilities, including advanced first principles analysis, engineering modeling, simulation and networking technologies, and precision laboratory scale and field testing capabilities (supported by Project BE-Testing Technologies and Integration).
- The project integrates and applies these advanced capabilities to support decision making in the face of rapidly evolving WMD threats in both military and civilian sectors. Products being developed include WMD target planning and assessment tools, WMD hazardous materials transport and collateral effects prediction tools, tools and technologies used to mitigate the effects of WMD on facilities and people, and consequence assessment/management tools to evaluate and respond to WMD events. Additionally, this project develops the enabling technologies used to produce anti-terrorist/force protection tools.
- This project also develops technologies to support force protection assessments and forensic analysis of terrorist events as well as advanced blast mitigation/retrofit techniques. Such tools developed on this project are used to enable other projects including Project BC-Force Protection and Technology Applications, and Project BF-CP Operational Warfighter Support. Also, they are made available to civilian, anti-terrorism and disaster response support organizations.
- This project provides and maintains the technology base, cornerstone to all components of weapons of mass destruction. It builds on expertise developed originally for nuclear weapon detonation(s) phenomenology [subsurface through exo-atmospheric], the evolution of the resulting disturbed environment, and the effects of that environment on systems.
- The expertise has expanded to all weapons of mass destruction. This is accomplished by providing weapons effects technology and information to U.S. and Allied government planners, operators, doctrine authors, and decision makers.
- It also develops and maintains the technical capability to predict the impact of the effects of weapons of mass destruction on communications, radar and optical sensor systems and to support DoD components in the analysis and prediction of the response of systems that must operate in nuclear and naturally disturbed environments.
- DTRA is the sole remaining center of excellence in the area of nuclear weapon burst phenomenology and the resulting interaction with military and civilian systems. Starting with weapon output calculations from the DOE laboratories, DTRA develops the tools for predicting the subsequent evolution of the blast and shock interactions for low-altitude, surface and sub-surface nuclear explosions; electromagnetic pulse (EMP); prompt, delayed, and trapped radiation; plasma and radioactive debris history. These efforts rely on ready access to High-Performance computing (HPC) resources to enable the efficient solution of the resultant large-scale numerical simulations.
- An integral component of this project is the provision of access to state-of-the-art (HPC) machines, high-speed connectivity, and superior technical support to DTRA researchers nationwide.

- DTRA shares with the special weapons related defense community a stewardship responsibility to maintain the Nation's core nuclear competencies and to successfully pass on this knowledge base and critical skills to the next generation of defense oriented scientists, engineers and weapon system developers.
- The Knowledge Application project is the tight integration of three efforts - Defense Threat Reduction Information Analysis Center (DTRIAC), Data Archival and Retrieval Enhancement (DARE), and Graybeard – dedicated to the collection and preservation of the data and knowledge derived during 50 years of nuclear weapons effects testing and studies; and a fourth effort, the Knowledge Applications component, that capitalizes on the expertise derived from these three programs to support current Agency technical programs.
- Without nuclear testing, research relies more on simulations and high fidelity calculations requiring correlation with this "legacy" data for validation.
- Also included in this project are civilian salaries required to directly support the development of products and services provided by this project.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Targeting Support	0	14.5	19.3	21.0

FY 2002

- Funding and activities performed in Project BD are in PE 0602715BR.

FY 2003 Plans

- Deliver version 2.0 of the Integrated Target Planning Tool Set (ITPTS v2.0) to the warfighter. Expand version 1.0 to include a full spectrum of targets and weapons.
- Begin development of the Integrated Comprehensive Weaponeering Capability that will include Raindrop interface and Joint Targeting Toolbox integration
- Demonstrate interoperability of intelligence, weaponeering, and collateral effects tools using ITPTS v2.0 during a mini-exercise
- Enhance existing DTRA planning tools into a prototype that will rapidly manipulate intelligence information and WMD computational tools to conduct targeting and operational analyses on mobile missiles/WMD.
- Improve the kinetic reaction parameters for agent defeat modeling for the Integrated Munitions Effects Assessment (IMEA) software tool in support of Project BF-CP Operational Warfighter Support.
- Continue development of IMEA v.5.0 capability with a nuclear module and additional capabilities in the buildings, bunkers, and tunnels modules.

- Validate the system-level Lethality/Vulnerability models for fixed, above-ground WMD targets using test data from a large-scale test.
- Develop an engineering and semi-empirical model for IMEA that accounts for traditional damage modes, to include cratering and breach, as well as flexural damage for buried bunkers.
- Develop a fragmentation model using the discrete particle methods.
- Develop an initial release of the Vulnerability Assessment and Protection Options (VAPO) tool to perform vulnerability assessments on structures with or without anti-terrorism design.
- Execute high-velocity penetration tests to develop a penetration model for emerging high-velocity weapons.

FY 2004 Plans

- Develop payload performance prediction models for baseline payloads against targets containing dry biological agents in support of Project BF-CP Operational Warfighter Support.
- Transfer the technology contained within the Design and Analysis of Hardened Structures to Conventional Weapons Effects (DAHS CWE) manual to the Vulnerability Assessment and Protection Options (VAPO) tool to automate the access of the technology.
- Validate the Lethality/Vulnerability models for tunnel targets containing WMD using test data from a large-scale test.
- Continue development of the Integrated Comprehensive Weaponeering Capability version 2.0 that will include a full-range of intelligence and targeting tools and nuclear target capability.
- Validate a discrete-particle method model for fragmentation effects using a full-scale test.
- Validate the high-velocity model.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Nuclear Phenomenology	0	17.9	16.6	23.2

FY 2002 Accomplishments

- Funding and activities performed in Project BD are in PE 0602715BR.
- Relocated DARE Operational Center from DC area to Albuquerque.
- Integrated DTRIAC and DARE programs.

FY 2003 Plans

- Distribute updated/documented nuclear phenomenology and system effects modeling software.
- Complete review of atmospheric nuclear effects knowledge base; identify shortfalls in context of anticipated requirements for system hardening and effects mitigation.
- Obtain Nuclear Weapons Effects (NWE) experts' review/approval of atmospheric nuclear effects knowledge base.
- Demonstrate a family of systems simulation capability. Incorporate suite of system-level tools into visualization suite.
- Continue revision of high altitude and underground burst nuclear weapon codes and their incorporation into large, scalable parallel computers.
- Maintain capability to provide the DTRA research community with ready access to world-class HPC resources.
- Complete first phase of numerical simulation code modernization effort.
- Complete the culling and converting of magnetic/electronic storage media to newer format.
- Continue to enhance DARE usability and functionality through adaptation and integration of current web technologies.
- Complete electronic guides to the data and knowledge for all five Graybeard Domains.
- Continue support for STRATCOM and Missile Defense Agency (MDA) functions
- Disseminate Knowledge Applications research findings and lessons learned (e.g., from the FY 2002 UGT review, Ground Vulnerability Number (GVN) improvements, Safeguard C – Test Readiness).
- Begin work on Volume 2 of Redbook and output from terrorist devices.
- Carry out analysis of effects of low-yield nuclear weapon in modern city.

FY 2004 Plans

- Complete development of baseline calculations to understand and establish bounds for selected uncertainties in "first principle" codes
- Characterize existing uncertainties as acceptable or not in context of foreseeable system support requirements.
- Assess impact of uncertainties on hardened and mitigated system designs.
- Integrate system level phenomenology tools into "real-time" simulations.
- Deliver documentation on baseline uncertainty calculations.
- Continue dissemination of nuclear effects predictions and system interaction tools.
- Continue support for STRATCOM and Missile Defense Agency (MDA) functions.

- Enhance computational and connectivity resources to insure the DTRA research community has ready access to world-class HPC capability.
- Continue numerical simulation code modernization effort.
- Initiate Development of an advanced 3-Dimensional Subsurface Effects Computational System for boutique effects assessments.
- Initiate advanced combined effects simulation system for near surface low-yield effects at critical population nodes.
- Incorporate nuclear weapon in city analysis into fast-running algorithms for HPAC/CATS.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Hazard Prediction and Assessment Capability (HPAC)/Consequence Assessment Tool Set (CATS)	0	32.7	18.3	16.6

FY 2002 Accomplishments

- Funding and activities performed in Project BD are in PE 0602715BR.

FY 2003 Plans

- Deliver HPAC 4.0.3 to Central Command (CENTCOM), Strategic Command (STRTACOM), European Command (EUCOM) and other Combatant Commands and service organizations. Incorporate industrial hazardous material source from facilities and transportation incidents. This version begins to validate industrial facility models for combustion and burning, validated urban transport, initial capability for building infiltration and interior dispersion, and casualty tables based on dynamic population. This version will meet the final deliverable for the CP2 ACTD demonstration.
- Develop chemical source terms as required for demonstrations and planning exercises. Begin validation of ITF chemical source terms to include kinetic chemistry.
- Train Combatant Command Staff personnel on the use of HPAC.
  Deliver HPAC-CATS (Nuclear) operational version to Strategic Command (STRATCOM).
- Leverage existing Geographical Interface System (GIS)-based infrastructure, consolidate collateral assessment tools (HPAC/CATS), and demonstrate client-server architecture for a forward deployable collateral assessment system (Consequence Hazard Analysis and Response Tool Set - CHARTS) in which the server performs most processing.
- Initiate integration of hazard prediction tools into OSD Joint Effects Module Block 1.
- Initiate integration of sensor data into hazard prediction models and assess feasibility of source term backtracking using sensor data.

- Complete initial validation of urban dispersion modeling capability and continue collaboration with the United Kingdom (UK), conduct full-scale urban dispersion test in collaboration with DOE, UK, and various other agencies and educational institutions.
- Initiate integration of HPAC weather data servers with Air Force Combat Climatology Center (AFCCC) climatology database server.
- Develop radiation and nuclear source term modules accounting for full decay and extended impacts of radioisotopes.
- Provide technical and operational support to OSD, Joint Staff, and combatant command contingency operations and exercises as required.
- Combat terrorism through consequence management and recovery using hazard prediction and decision support tools.
- Combat terrorism through vulnerability reduction technology measures that deal with the volatile fuels, toxic industrial chemicals and WMD materials.

FY 2004 Plans

- Conduct validation of urban dispersion modeling capability upon completion of full-scale urban test.
- Initiate integration of population movement and evacuation algorithms with casualty estimation tables.
- Complete full decay scheme for nuclear and radiological source terms in HPAC.
- Initiate development of water transport model in collaboration with US Navy. Water transport model will encompass rivers, ports, and oceans (littoral region).
- Develop littoral-region mesoscale weather forecasting model and demonstrate integrated capability.
- Initiate development of economic and environmental assessment algorithms/methods resulting from nuclear or radiation contamination.
- Initiate development of CBRNE Decision Support Tool to assist combatant commands, services, and installation commanders with consequence management planning and decision making.
- Deliver initial validated capability of interior building transport model to NORTHCOM and service organizations.
- Deliver operational mesoscale ensemble weather for hazard prediction operations.
- Provide technical and operational support to OSD, Joint Staff, and combatant command contingency operations and exercises as required.
- Initiate integration of hazard prediction tools into OSD Joint Effects Module Block 1.
- Continue development of water transport model in collaboration with US Navy. Water transport model will encompass rivers, ports, and oceans (littoral region).

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	**PROJECT NAME AND NUMBER:** Project BD - Weapon Effects Technologies

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Advanced Systems and Concepts Office (ASCO)	0	8.0	8.0	8.2

FY 2002 Accomplishments

- Funding and activities performed in Project BD are in PE 0602715BR.

FY 2003 Plans

- Stimulate, identify, and execute high-impact studies that encourage new thinking, address technology gaps, and improve the operational capabilities of DoD, DTRA, and other Government Agencies.
- Commission and perform a wide array of study efforts to address areas of force protection and operations; homeland defense and countering terrorist attacks; strategic issues; and other unconventional threats and vulnerabilities.
- Finalize the conceptual plan for an integrated national bio-forensics capability.
- Accomplish broad spectrum WMD intelligence collection gaps and needs assessment.

FY 2004 Plans

- Perform systems analysis studies to predict new WMD threats.
- Stimulate, identify, and execute high-impact projects to address long-term resolution of WMD issues.
- Provide long-range analytical support to the warfighter.
- Develop architectures and capabilities to reduce current and emerging threats.
- Emphasize cross-cutting integration and alternative thinking and strategies.

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	**PROJECT NAME AND NUMBER:** Project BD - Weapon Effects Technologies

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Infrastructure	0	10.2	0	0

FY 2002 Accomplishments

- Funding and activities performed in Project BD are in PE 0602715BR.

FY 2003 Plans

- Provided for payment of civilian salaries.

FY 2004 Plans

- Civilian salaries transferred to O&M

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602716BR	**PROJECT NAME AND NUMBER:** Project BE – Testing Technologies and Integration

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BE - Testing Technologies & Integration	0	11.3	12.0	12.1	12.4	12.5	12.7	13.0

A. Mission Description and Budget Item Justification:

- This project provides a unique national test-bed capability for Weapons of Mass Destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs.
- The project develops, provides and maintains test-beds used by the DoD, the Services, the Combatant Commanders and other federal agencies to evaluate the implications of WMD, conventional, and other special weapon use against U.S. military or civilian systems and targets.
- This project leverages fifty years of testing expertise to investigate weapons effects and target response across the spectrum of hostile environments that could be created by proliferant nations or terrorist organizations with access to advanced conventional weapons or WMD (nuclear, biological and chemical).
- Specific programs supported by this project include:
  - Hard Target Defeat (HTD);
  - Anti-terrorism (AT);
  - CP2 Counterforce Advanced Concept Technology Demonstration (ACTD);
  - Special Operations Forces (SOF).
- This project maintains testing infrastructure to support:
  - Warfighters;
  - other government agencies;
  - friendly foreign countries testing requirements on a cost reimbursable basis.
- This project also develops strategy and planning for a WMD test-bed infrastructure focusing on nuclear, biological, and chemical facilities, and the hard and deeply buried facilities in which these activities are often located.
- The project provides support for full and sub-scale tests that focus on weapon-target interaction with fixed soft and hardened facilities to include aboveground facilities, cut-and-cover facilities and deep underground tunnels.
- Specific activities include:
  - testbed design and construction;
  - instrumentation and data collection;
  - test coordination and execution;
  - post-test analysis and documentation.
- This project directly supports:
  - PE 0602717BR - Project BC;
  - PE 0602716BR - Projects BD & BF;
  - PE 0603160BR - Projects BJ & BK.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Test-Bed Operation and Support	0	9.1	9.6	10.0

FY 2002 Accomplishments

- Funding and activities performed in Project BE are in PE 0602715BR.

FY 2003 Plans

- Continue to provide unique test-bed capabilities for weapon-target interaction and WMD programs. Expect to support 5 major CP2 ACTD demonstrations, 8 Hard Target Defeat demonstrations, 14 antiterrorism technology tests and 15 general phenomenology and Service support tests.
- Provide an inventory of unique targets, infrastructure support, and expertise for conduct of major integrated test programs, including instrumentation maintenance, gauge installation, data recording, source diagnosis, environmental support, safety support, experiment installation, experiment fielding, and test fielding.

FY 2004 Plans

- Continue to provide unique national test-bed capabilities for weapon-target interaction and WMD programs. Expect to support approximately 50 tests this year.
- Provide an inventory of unique targets, infrastructure support, and expertise for conduct of major integrated test programs, including:
  - instrumentation maintenance
  - gauge installation
  - data recording
  - source diagnosis
  - environmental support
  - safety support
  - experiment installation
  - experiment fielding
  - test fielding

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Field Support	0	1.7	1.9	1.8

FY 2002 Accomplishments

- Funding and activities performed in Project BE are in PE 0602715BR.

FY 2003 Plans

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

FY 2004 Plans

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

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Simulator Technology	0	.5	.5	.3

FY 2002 Accomplishments

- Funding and activities performed in Project BE are in PE 0602715BR.

FY 2003 Plans

- The original Large Blast and Thermal Simulator (LB/TS) will complete the following upgrade: Driver tube section and end caps are being modified to remove hydro plugs. This should allow a more inexpensive test with the same fidelity.
- Continuation of LB/TS in caretaker status, with limited testing of protective structures.

FY 2004 Plans

- Continue to maintain the Large Blast and Thermal Simulator in caretaker status.
- Tests can be accomplished with short notice.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	**PROJECT NAME AND NUMBER:** Project BF – CP Operational Warfighter Support

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BF - CP Operational Warfighter Support	0	50.6	44.9	96.0	101.5	101.1	102.3	103.9

A. Mission Description and Budget Item Justification:
This project will provide targeting and Intelligence Community (IC) support, exercise CP technologies and products with the users, develop DoD compliant simulations that exploit CP models for target planning and collateral effects prediction, and demonstrate CP capabilities in operationally realistic environments. The technical approach is to integrate technologies developed in other CP 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 CP technologies into customer operations, and to support use of these capabilities during contingency operations. This project focuses on three thrusts that support outside customer requirements. The three thrusts are: 1) Operational Support Technology, 2) Target Defeat (TD) program, and 3) Combatant Commander Planning Support. The CP Operational Warfighter Support project provides the bridge between the CP technology base and operational 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.

- **Operational Support Technology.** The Weapons of Mass Destruction Assessment and Analysis Center (WMDAAC) provides the warfighter with the capabilities and understanding for countering the use and effect of Weapons of Mass Destruction (WMD) through the advancement of simulation technology, assessment of operational impact, development of collaborative capabilities and access to mature computer models. Specifically: (1) WMDAAC develops advanced simulations from first-principles physics models produced in other projects in this program element (extensively Project BD). WMDAAC personnel provide an interface between DTRA model developers and the weapons effects simulation community to ensure maximum utility of DTRA models in distributed interactive simulations through compliance with C4ISR & High-Level Architecture (HLA) standards and protocols documented in Federation Object Models. (2) WMDAAC uses these advanced simulations to assist the warfighter in quantifiably assessing operational theater plans and post-attack warfighting effectiveness and to develop alternatives to mitigate the effects of WMD. (3) WMDAAC develops and adapts capabilities to project information through advanced visualization techniques and advanced collaboration at widely dispersed locations including Combat Commanders. Commercial and government-developed technologies are selected and proven in a research environment, and then transitioned to the DTRA Operations Center and/or other warfighter customers. (4) WMDAAC provides warfighters and first responders with ready access to mature computer models, WMD databases and expert field assistance and training. The end result is to provide more realistic models and simulations of the effects of WMD for use in training, analysis, experimentation, operational environments and acquisition. In FY04, the WMDAAC will begin the development of a Weapons of Mass Effect (WME) Battle Laboratory. The WME Battle Lab is a natural "next step" in the evolution of WMDAAC's simulation and collaboration technology development activities combined with its operations research capability into a resource which will enable the warfighter to better understand the effects of WME and refine concepts of operation and battle plans.

- **Target Defeat Program.** The United States and its allies face a growing threat related to critical military targets hidden within and shielded by hardened, deeply buried tunnel complexes. These complexes may house biological/chemical/nuclear weapons production or storage facilities; command, control, and

communications facilities; and theater ballistic missiles and their transporter-erector-launchers (TELs). An objective of this project is to examine the existing U.S. and Allied capabilities to hold hardened, deeply buried tunnel targets at risk, thereby defining a current performance baseline. Any deficiencies will be identified and the ability of planned systems to address these deficiencies will be assessed. Finally, new technologies needed to mitigate remaining shortfalls will be evaluated as candidates for new hard target defeat acquisitions. Activities respond to warfighting requirements derived from the Hard and Deeply Buried Target Defeat capstone requirements document, and to RDT&E priorities by the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD (AT&L)). Funds added as a result of the Secretary of Defense strategic review for FY 2002 are being used to develop technologies identified in the Hard and Deeply Buried Target Defeat HDBTD S&T Master Plan.

The following milestones have been divided into five major functional areas needed to develop target defeat capabilities: find, characterize and assess technologies; planning capability; attack technologies; tunnel defeat testing; and ACTDs & demonstrations.

- Targeting and intelligence community (IC) Support, part of Target Defeat, provides functional vulnerability assessments of hostile foreign systems in support of warfighter and IC requirements. It assists the Combatant Commanders and IC in target planning against hard and deeply buried facilities. The assessments leverage databases, methodologies, and technical expertise developed during Balanced Survivability Assessments (PE 0602717BR, Project BC). Details of specific individual assessments are classified.

- This project focuses weapon/target interaction and target planning tool technology base efforts completed in Project BD on tunnel applications. The program depends on test planning and execution support from Project BE. Products from this project are transitioned to PE 0603160BR, Project BK for Command, Control, Communications, and Intelligence (C3I) facility demonstration and the Thermobaric Advanced Concept Technology Demonstration. Efforts in this program provide part of the technology base needed for counterproliferation activities conducted in other DoD programs.

- **Combatant Commander Planning Support.** This activity develops modeling and simulation tools and applies them to support the warfighter in development of war plans. Theater and campaign level simulation and modeling tools are also being developed and produced. The War Planning Support (WPS) program is used to assess/analyze war plans or to evaluate the benefits of new technology on improved warfighter efficiency and effectiveness. Two tools currently being developed for theater and campaign level simulation and modeling are the Integrated Theater Engagement Model (ITEM) and the Synthetic Exercise Environment (SEE).

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Operational Support Technology	0	11.0	9.1	9.5

FY 2002 Accomplishments

- Funding and activities performed in Project BF are in PE 0602715BR.

FY 2003 Plans

- Investigate and demonstrate the utility of a WME Urban Dispersion Model for use and re-use in a collaborative 4-Dimensional (x, y, z, and time) simulation environment for integration into the Global Command & Control System for Combatant Commander application and use.
- Web enablement of the COTS Chemical Biological Response Aide (CoBRA), a tool for DoD and other federal agencies to deal with and report on WME incidents.
- Investigate and demonstrate the utility of data from weapon testing and special weapons development programs such as DTRA's and selected DoD high-explosive tests for improving simulations for visual display during exercises for Combatant Commanders to improve the understanding of weapons effects on military operations and domestic support as directed.
- Guide development of DTRA capabilities, concepts and tools through participation in DoD DMSO conferences, workshops, and Combat Commander's exercises and real world requirements.
- Development of interface standard protocols for Chemical, Biological, Radiological and Nuclear (CBRN) sensor interfaces for integration into the C4ISR architecture IAW Defense Interoperability Interface (DII) into the Common Operational Environment (COE) directives.
- Continue education and training role through participation in selected Joint, Combatant Commands and service school exercises, experiments and wargames.
- Develop an ontology for CBRNE to be used in advanced knowledge management technologies, to enhance decision support mechanisms and decision support tools for the warfighter.
- Advance high-fidelity physics-based models and databases of targets, weapons, and post-strike effects that support real/near-real time viewing of dynamic weapons effects for improved targeting, Battle Damage Assessment (BDA), no-drop bomb scoring, and course of action development.
- Integration of Restoration of Operations (RESTOPS) ACTD results into an airbase effects assessment tool, which includes chemical and biological weapon effects to conduct operational research.
- Institutionalize collaborative and reachback capabilities to support DTRA's role in satisfying emerging warfighter and homeland security requirements.

- Complete full stand up of the DTRA Alternate Reachback Center for 24/7 operational support of Combatant Commander's and DoD, JCS and service operational requirements.
- Continue support of other federal agencies as directed in the war against terrorists as it pertains to CBRNE issues exploiting information technology with assured security.

FY 2004 Plans

- Begin design and installation of information technology infrastructure for WME Battle Lab. Incorporate sufficient computing and bandwidth capability to exploit physics based models for weapon target interaction in 4-dimensional real-time visualization. Plan for a facility to support warfighter planning and training by improving their understanding of WME on the battlefield.
- Integrate the utility of a WME Urban Dispersion Model for use and re-use in a collaborative 4-Dimensional (x, y, z, and time) simulation environment into the Global Command & Control System for Combat Commander application and use.
- Integrate CBRN databases, sensors and simulations into the DoD and supported intelligence agencies collection systems using advanced knowledge management technologies, enhancing decision support mechanisms and decision support tools for the warfighter and other federal agencies as directed.
- Complete Seaport Effects Assessment tool, which includes chemical and biological weapon effects to conduct operational research.
- Continue participation in the Millennium Challenge exercise series, with focus on integrating coalition WME expertise with DTRA modeling and simulation.
- Continue development, injection, and integration of advanced WME modeling and simulation capabilities into warfighter C4ISR architecture.
- Incorporate enhanced Air Operations capability in WMD Operational Assessment Model (OAM) to support WME analysis of Theater Air War.
- Complete CBRN Sensor Placement Study for large sites (e.g. military bases) to optimize force protection resources and ensure mission continuity.
- Provide common operating picture of WMD information with NORTHCOM
- Demonstrate live, constructive virtual integration of WMD effects within MC 04-07.
- During Homeland Security ACTD, field improved HLS collaboration technologies to services and combatant commands for CONUS and OCONUS military installations and critical infrastructure as it pertains to WMD.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Combatant Commander Planning Support	0	1.0	0	0

FY 2002 Accomplishments

- Funding and activities performed in Project BF are in PE 0602715BR.

FY 2003 Plans

- Complete phased War Planning Support (WPS) analytical efforts for USFK, MARFOR/CPF (USPACOM), CNE (USEUCOM), and USCENTCOM.
- Complete WPS analytical support to the Commanding General 32nd AAMDC and complete transitioning applications to USFK and USCENTCOM Area of Responsibility (AOR) requirements.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Find, Characterize and Assess (FCA) Technology	0	5.6	8.0	9.4

FY 2002 Accomplishments

- Funding and activities performed in Project BF are in PE 0602715BR.

FY 2003 Plans

- Continue development of find/characterize/assess technologies to improve the national capability to functionally defeat tunnel facilities.
- Continue development and validation of remote site geologic characterization technology.
- Continue development of reverse engineering methodology to characterize tunnel facilities.
- Demonstrate a prototype of the Underground Targeting and Analysis System (UTAS) that develops three-dimensional models of underground targets.
- Continue targeting and IC support by conducting assessments of hostile facilities based on JCS and Combatant Commanders priorities. Details are classified.
- Complete increment of 60 facility models and a geotechnical template for hard and deeply buried target characterization.

- Document lessons learned from Red-Blue-White exercise.
- Award contract for WMD material assessment, and finalize relational database architecture for delivery in early FY 2004.

FY 2004 Plans

- Characterize Capitol Peak Test Site Geotechnical
- Complete Final Document Classified Geologic Templating Capability
- Develop Final Slope Model for Geologic Template Methodology
- Compile Results from 8-Site Validation Study
- Improve Streamlined Procedures for Characterization of Deep Geology
- Develop C3I Reconstitution Model

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Attack Technology	0	14.2	12.0	43.7

FY 2002 Accomplishments

- Funding and activities performed in Project BF are in PE 0602715BR.

FY 2003 Plans

- Identify mission critical equipment and vulnerabilities for WMD production tunnel facilities.
- Continue development of defeat technologies to model and predict penetration of multiple weapons, tunnel damage, and advanced weapon performance.
- Continue development of high-payoff novel explosive concepts using advanced energetic materials to enable defeat of targets currently invulnerable to weapons solutions.
- Complete Deep Digger laboratory technology verification experiments, and conduct preliminary design review for prototype design.

FY 2004 Plans

- Collect Experiment Data on New Model Thermobaric (TB) Formulations and Refinement of TB Metrics
- Enhance Coupled Combustion and Flow in TB Detonations
- Identify TB Weapon Concepts for Use Against Hard & Deeply Buried Targets
- Initiate Mechanisms in Nanoreactive Materials
- Model N/R Energy Coupling to Targets
- Synthesis and Scale-Up NF2 Compounds
- Apply Coated Nanoparticles to Weapon Payloads
- Develop Model and Perform Calculations for Non-Energetic Payloads.
- Assess Data from Field Impact Tests of Projectiles with Unstable Trajectory
- Develop Weapon System Survivability Model for Horizontal (Skip Bomb) Delivery
- Develop Algorithm for Weapon Trajectory Stability in Horizontal (Skip Bomb) Delivery
- Analyze High Velocity (HV) Penetration Lab Data Evaluating Oblique Impacts of Novel Case Shapes
- Develop Portal Extension Engineering Response Model
- Update Adit Closure Model for Smaller Diameter (Vent-Size) Openings
- Integrate Fragment Model with 1.5D Airblast Model (MEA 6.0)
- Assess Experiment Data for Development & Validation of Vent-Related Airblast Models
- Develop Methodology to Assess Equipment Fragility Based on Generic Characterization
- Develop Equipment Fragility Model for MEA 6.0
- Obtain Joint Technical Coordinating Group (JTCG)-Accreditation of MEA Equipment Fragility Model for C3I Tunnel Type
- Improve Blast Door Model for MEA 6.0
- Design Prototype Submunition and Sensor to disrupt tunnel operations.
- Accelerate development of high-payoff novel explosive concepts using advanced energetic materials to enable defeat of targets currently invulnerable to weapons solutions.
- Construct Deep Digger full scale prototype, and demonstrate penetration performance.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Planning Capability	0	1.5	1.8	4.3

FY 2002 Accomplishments

- Funding and activities performed in Project BF are in PE 0602715BR.

FY 2003 Plans

- Continue development of system fragility and response models for C3I equipment.
- Develop tunnel aimpoint optimization models to increase the effectiveness of the planning tools developed for warfighter planners.
- Continue assessments of hostile facilities based on JCS and Combatant Commanders priorities. Details are classified.
- Develop improved weapon/target interaction models of tunnels and liners to nuclear groundshock environments and implement them in Munitions Effects Assessment (MEA) planning tool.

FY 2004 Plans

- Release MEA 6.0
- Update Nuclear Planning Tool (MEA-N)

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Tunnel Defeat Testing	Realigned	14.7	14.0	29.1

FY 2002 Accomplishments

- Funding and activities performed in Project BF are in PE 0602715BR.

FY 2003 Plans

- Complete construction of tunnel portals and begin planning for operational tunnel defeat demonstrations using standoff and advanced weapons at the White Sands Missile Range.

FY 2004 Plans

- Conduct DIVINE WARHAWK Sub Portal Tests

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
ACTD's and Demos	Realigned	2.6	0	0

FY 2002 Accomplishments

- Funding and activities performed in Project BF are in PE 0602715BR.

FY 2003 Plans

- Conduct functional defeat operational demonstrations on the C3I tunnel complex to be constructed at the Nevada test Site.
- Determine reconstitution time for functional defeat attacks on the C3I tunnel facility.
- Conduct demonstrations and evaluations of sensor technologies to improve battle damage assessment (BDA) of functional attacks on tunnel facilities.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602716BR	**PROJECT NAME AND NUMBER:** Project BG – Nuclear Operations

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BG Nuclear Operations	0	15.2	62.1	69.0	64.0	64.0	59.0	59.0

A. Mission Description and Budget Item Justification:

- This program directly reflects the National Military Strategy, supports the provisions of Joint Vision 2020, and is directed by the JCS in the Joint Strategic Capabilities Plan (JSCP) Nuclear Annex.
- This project encompasses WMD (Nuclear) Protection and Response.
  - Responsive to the oversight of the Nuclear Weapons Council, the project provides critical support to the Combatant Commanders, Services, JCS and OSD.
  - This project continues the realignment begun by DTRA at its inception so as to deal with the emerging 21st Century strategic landscape.
  - This activity and in direct support to the National Military Strategy, these programs will:
    - promote initiatives to detect the surreptitious introduction and use of weapons of mass destruction against the U.S. and its allies thereby protecting our citizens and critical infrastructures;
    - potential adversaries, whether nations, terrorist groups or criminal organizations, will be tempted to use asymmetric means of war such as weapons of mass destruction to counter U.S. conventional weapon superiority;
    - promoting such initiatives enhances deterrence and proactively supports the agency's mission of WMD threat reduction.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
WMD (Nuclear) Protection and Response	0	15.2	14.1	0

FY 2002 Accomplishments

- Funding and activities performed in Project BG are in PE 0602715BR.

FY 2003 Plans

- Develop a portable, mobile, and rapidly deployable radiation detection and tracking system, a portion of which will be comprised of remote sensors linked to central receiving/processing station via Radio Frequency (RF) signals. Continue effort and begin integration of detection arrays with communication and analytical software. Expand upon mobile prototype, and continue software development toward future deployment of three attended or unattended variants, including mobile, maritime, and stationary or portal.
- Provide Combatant Command Technical Support Groups (TSG) ability to employ the system based on intelligence cueing. Continue effort and expand to varied geographic and operational environments to evaluate operability.

- Develop and field passive and active Special Nuclear Material (SNM) detection systems capable of detection in cases where SNM is shielded; current detector technologies do not perform well when SNM is shielded for gamma and/or neutron emissions. Continue effort by funding scientific review panel and technical support to review studies and proposals to determine promising track for detailed research.

- Produce through development and adaptive engineering detection equipment capable of rapid and standoff detection of radioactive materials across a broad spectrum of operational environments including uncertain and hostile. Develop equipment that without significant degradation is waterproof, shockproof, and resistant to extreme conditions and sustained employment. Develop lighter weight and smaller detector systems for more diverse field employment.

- Integrate through new concept design or adaptive engineering multiple detection sensor systems to facilitate standoff operator detection of radioactive material and passive or active trigger, alarm, destruct, or detection devices targeting the operator.

- Establish administrative support structure to support technical reporting and document production of R&D development efforts. Reporting program must have broad enough scope to permit publication at classified and unclassified levels, and permit literature review and exploration of existing technologies to eliminate duplicating or redundant efforts, and exploit dual or multiple-use technologies.

- Conduct operational analysis of commercial, vendor, "off-the-shelf", laboratory-produced concept design, or theoretical radiation detection devices in order to determine relative efficiencies, capabilities, and technologies to further enhance the ability to develop, procure, and employ reliable and current technologies for radioactive material detection. Enhance tools and capability for rapid attribution of the source of a nuclear event.

FY 2004 Plans

- Continue the development of a rapidly deployable radiation detection and tracking system, integration of detection arrays with satellite communication and analytical software, expansion of multiplatform system prototype, and software development toward future deployment of attended or unattended variants, including mobile, maritime, aerial, and stationary or portal.

- Continue support to Combatant Commanders Technical Support Groups (TSG)

- Continue developing and fielding passive and active Special Nuclear Material (SNM) detection systems capable of detection in cases where SNM is shielded; current detector technologies do not perform well when SNM is shielded for gamma and/or neutron emissions. Continue effort by funding scientific review panel and technical support to review studies and proposals to determine promising track for detailed research.

- Continue the development of adaptive engineering detection equipment capable of rapid and standoff detection of radioactive materials across a broad spectrum of operational environments including uncertain and hostile. Develop equipment that without significant degradation is waterproof, shockproof, and resistant to extreme conditions and sustained employment. Develop lighter weight and smaller detector systems for more diverse field employment.

- Continue integration through new concept design or adaptive engineering multiple detection sensor systems to facilitate standoff operator detection of radioactive material and passive or active trigger, alarm, destruct, or detection devices targeting the operator.
- Continue operational analysis of commercial, vendor, "off-the-shelf", laboratory-produced concept design, or theoretical radiation detection devices in order to determine relative efficiencies, capabilities, and technologies to further enhance the ability to develop, procure, and employ reliable and current technologies for radioactive material detection.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Classified Program	0	0	48.0	69.0

FY 2002 Accomplishments
Funding and activities performed in Project BG are in PE 0602715BR **Classified**

FY 2003 Plans
N/A (Note: Anticipate Department to reprogram funding in year of execution in support of this program)

FY 2004 Plans
Classified

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602716BR	**PROJECT NAME AND NUMBER:** Project BG – Nuclear Operations

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** Strategic Defense Technologies 0602717BR

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total 0602717BR Cost	0	118.0	116.1	116.8	112.7	113.6	114.0	115.6
Project BB Small Business Innovative Research	0	1.3	1.3	1.3	1.3	1.3	1.3	1.4
Project BC Force Protection & Technology Applications	0	3.8	2.0	2.1	1.8	1.8	1.8	1.8
Project BG Nuclear Operations	0	26.4	26.8	23.2	27.5	27.5	28.1	28.4
Project BH System Survivability	0	86.5	86.0	90.2	82.1	83.0	82.8	84.0

A. Mission Description and Budget Item Justification:

- The mission of the Defense Threat Reduction Agency (DTRA) is to safeguard America and its friends from weapons of mass destruction (WMD) by reducing the present threat and preparing for the future threat. This mission directly reflects the National Military Strategy, supports the provisions of Joint Vision 2020 and is specifically directed by the JCS in the Joint Strategic Capabilities Plan (Nuclear Annex). To achieve this mission, DTRA has identified principal objectives along with strategies and tasks to ensure the objectives are met. Three of these objectives are deter the use of WMD, reduce the present threat and prepare for the future threat. A focused, strong threat reduction technology base is critical to achieving these objectives. DTRA has taken the steps to develop this technology base.

- This budget submission provides the essential technologies to deter the use of nuclear weapons and prepare for the projected nuclear 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 associated costs necessary to support the development of the technology base needed to support the national deterrent policy and military strategy. Initiatives supported 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 such activities as balanced survivability assessments, operational assessments, nuclear physical security technology development, and assessments of various OPTEMPO concerns obtained from Chemical, Biological, Radiological, and Nuclear Environments (CBRNE).
  - Support to OSD, JCS and Combatant Commands in war planning, force structure options and technology impacts, logistics, WMD mitigation operations and stockpile programs.
  - Develop and validate 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 technology programs focused on:
    - Simulator assessment technology
    - Electromagnetic Protection Technology

  - Radiation hardened microelectronics technology
  - Nuclear Phenomenology, including
    - High Performance Computing
    - Nuclear effects
    - Nuclear technology knowledge application
  - Develop and validate technology programs designed to provide terrorist device defeat across the CBRNE spectrum.

- Nuclear sustainment technologies and projects support the viability and credibility of the nuclear force as well as development of nuclear environment survivability for Theater Missile Defense and National Missile Defense.

- The nuclear sustainment program, driven by the specific taskings of the National Strategy, National Military Strategy 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 C4I requirements; and WMD threat mitigation analyses.

  - The System Survivability Project develops simulator technology (nuclear, blast, thermal, radio frequency (RF) propagation, and optical/infrared (IR) background effects), electronics protection technology (radiation-hardened microelectronics, balanced electromagnetic hardening technology, radio frequency threat reduction), assessment and protection technology, and provides technology to support the Congressionally 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.

B. Program Change Summary:

	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget	**0**	**131.2**	**125.4**	**124.0**
Current President's Budget	**0**	**118.0**	**116.1**	**116.8**
Total Adjustments	**0**	**-13.2**	**-9.3**	**-7.2**
Congressional program reduction		**-10.0**		
Congressional rescissions		**-2.2**		
Congressional increases				
Reprogrammings				
Internal Transfers (DoD Defense-Wide)		**-1.0**	**.7**	**-.1**
Internal Transfers (Within DTRA)			**-10.0**	**-7.1**
SBIR/STTR Transfer				

Change Summary Explanation:

- In order to better define and capture its 6.2 resources, DTRA has created two new program elements:
  - WMD Defeat Technology (0602716BR)
  - Strategic Defense Technologies (0602717BR).
- Effective with FY 2003, specific resources associated with Projects BB, BC, BG, and BH will be split from the existing PE 0602715BR and realigned into PE 0602717BR, Strategic Defense Technologies.
- The decrease in FY 2003 from the previous President's Budget to the current President's Budget is the result of Congressional and Departmental action. Congress reduced this program by $10M and Congressional recissions affecting this program amounted to $2.2M (-$1.2M Section 8100-Business Process Reform/Management Efficiencies, -$.2M Section 8109-Reduce Cost Growth of Information Technology Development, and -$.8M Section 8135-Revised Economic Assumptions). The Department also transferred $1M from DTRA from this PE as part of an OMB inflation adjustment.
- The decrease in FY 2004-2005 from the previous President's Budget to the current President's Budget is primarily the result of DTRA's internal Program Review and reflects a carefully balanced program focused on safeguarding America's interest from WMD by controlling and reducing the threat by providing quality tools and services for the warfighter. Accordingly, resources have been reprogrammed to support critical requirements across the spectrum of combat support, technology development, threat control, and threat reduction mission areas.
- 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.

- In FY 2004-2005, the Department transferred $2.5M to DTRA in support of the Physical Security Equipment program; funding was also transferred from DTRA to other DoD elements as part of the revised Non Pay Purchase Inflation adjustment.

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

D. Acquisition Strategy: N/A

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602717BR	**PROJECT NAME AND NUMBER:** Project BB– Small Business Innovative Research

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BB - Small Business Innovative Research	0	1.3	1.3	1.3	1.3	1.3	1.3	1.4

A. Mission Description and Budget Item Justification:

- This project
  - provides the means for stimulating technological innovation in the private sector;
  - strengthens the role of small business in meeting DoD research and development needs;
  - fosters and encourages participation of minority and disadvantaged businesses in technological innovation;
  - 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 2002	FY 2003	FY 2004	FY 2005
Small Business Innovative Research	0	1.3	1.3	1.3

FY 2002 Accomplishments

- Funding and activities performed in Project BB are in PE 0602715BR.

FY 2003 Plans

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

FY 2004 Plans

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

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602717BR	**PROJECT NAME AND NUMBER:** Project BC– Force Protection & Technology Applications

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BC - Force Protection & Technology Applications	0	3.8	2.0	2.1	1.8	1.8	1.8	1.8

A. Mission Description and Budget Item Justification:

- This project supports Assessment and Mitigation Technologies, which conducts mission vulnerability assessments of strategic U.S./Allied systems to facilitate the development of investment strategies for improved survivability, to include nuclear command and control.
- This program also ensures that assessment training programs, engineering designs, and new construction embody sound force protection, vulnerability mitigation, and collective protection principles.
- DTRA technologies and expertise are applied to enhance U.S. capabilities across the spectrum of the counterproliferation and force protection missions. These may include development of sensor technologies for initially identifying the consequences of weapons of mass destruction (WMD) through countering or protection against this threat.
- Some of the program's products and services include:
  - Balanced Survivability Assessments (BSA)
  - Smart Building program's strategic facility construction design and cost estimates
  - Vulnerability out-briefs and written reports
  - Overall vulnerability trend data
  - National and NATO conferences for Underground Facility Managers
  - Multi-disciplined technical engineering expertise support

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Balanced Survivability Assessments	0	2.0	2.0	2.1

FY 2002 Accomplishments

- Funding and activities performed in Project BC are in PE 0602715BR.

FY 2003 Plans

- Conduct balanced survivability and integrated vulnerability assessments on DoD facilities as tasked by Combatant Commands, the Joint Staff, and OSD/ C3I.
- Continue integrated vulnerability assessment of defense and critical national infrastructure facilities.

FY 2004 Plans

- Conduct balanced survivability and integrated vulnerability assessments on DoD facilities as tasked by Combatant Commands, the Joint Staff, and OSD/C3I.
- Continue integrated vulnerability assessment of defense and critical national infrastructure facilities.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Smart Building Program	0	1.8	0	0

FY 2002 Accomplishments

- Funding and activities performed in Project BC are in PE 0602715BR.

FY 2003 Plans

- Complete decommissioning for the Smart Building.
- Prepare final reports and present results at various venues.
- Transition lessons learned and technology to various ongoing DoD programs.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602717BR	**PROJECT NAME AND NUMBER:** Project BG – Nuclear Operations

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BG - Nuclear Operations	0	26.4	26.8	23.2	27.5	27.5	28.1	28.4

A. Mission Description and Budget Item Justification:

- These programs directly reflect the National Military Strategy, support the provisions of Joint Vision 2020, 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
  - Combatant Commands/Forces/Security Support.
  - Responsive to the oversight of the Nuclear Weapons Council, they provide critical support to the Combatant Commands, Services, JCS and OSD.
- This project continues the realignment begun by DTRA at its inception so as to deal with the emerging 21st Century strategic landscape, and is divided into the two areas as described above:

- **Nuclear Programs**.
  - Nuclear Weapons Surety: As tasked by the DoD Nuclear Weapon System Safety Program, the surety programs will provide Combatant Commands, Services, and JCS with technical analysis, studies, research, and experimental data to identify and quantify risks of plutonium dispersal and Loss of Assured Safety (LOAS) due to accidents, fires or natural causes during normal, peacetime operations of the nations nuclear weapon systems. Additionally, studies to quantify the probability of success of targeted terrorist attacks on DoD facilities, leveraging these risk assessment advances.
  - Nuclear Mission Management Plan (NMMP): As tasked by Deputy Secretary of Defense and Director, Defense Research and Engineering (DDR&E), and in support of national requirements to maintain a strategic nuclear deterrent, conduct assessments and develop long-range plans, the continued development of the DoD Nuclear Mission Management Plan is designed to provide a comprehensive, integrated DoD roadmap for the sustainment and viability of U.S. nuclear forces, personnel, and infrastructure.
  - Stockpile Sustainment: Continue to act as DDR&E's Executive Agent for Annual Certification support related stewardship and sustainment activities.
  - Stockpile Operations Support: In support of national requirements to maintain a viable nuclear deterrent, this program provides automated tools to maintain, report, track and highlight trends affecting the nuclear weapon stockpile. It will provide crucial business process and information support to ensure continued sustainability and viability of the nuclear stockpile.

- **Combatant Command /Forces/Security Support**.
  - As tasked by the JSCP and DoD Directives, these programs will provide Combatant Commands, Services, JCS and DoD with focused analyses in support of nuclear planning and operations and WMD threat mitigation as they pertain to the combat survivability of the forces.

- Additionally, they provide the DoD nuclear physical security applied research and force-on-force (FoF) testing programs to help insure the security of our nuclear forces.
- Provides technical support and curriculum development and enhancement for the Defense Nuclear Weapons School (DNWS), to include other WMD support, and other DoD nuclear training activities.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Nuclear Programs	0	19.1	17.8	13.1

FY 2002 Accomplishments

- Funding and activities performed in Project BG are in PE 0602715BR.

FY 2003 Plans

- Nuclear Weapon Surety Thrusts:
  - Conduct modeling and testing to respond to weapon storage facility and weapon system safety requirements and criteria.
  - Continue the development and population of a "Nuclear Surety Information Center", a weapon surety database and interface to utilize and archive completed assessments, studies, tools and test programs.
  - Complete the B-2 Weapon System Safety Assessment.
  - Begin forensics nuclear activation project with Oak Ridge National Lab.
  - Complete Phase II SBIR –Automated Vulnerability Evaluation for Risks of Terrorism (AVERT) model and Isis model.
  - Begin Sentry forensics database project.
  - Begin storage facility fire suppression project.
  - Begin development of electrical system Penetration Tester.
  - Support annual certification and stockpile stewardship for the continued safety and reliability of the U.S.nuclear stockpile in the absence of underground testing.
  - Continue evaluation of enduring stockpile weapons in support of the Air Force and Navy.
  - Prepare an Annual Surety Report for SECDEF and President.
- Stockpile Sustainment Program thrusts:
  - Support annual certifications, at Presidential direction, of the continued safety and reliability of the U.S. nuclear stockpile in the absence of underground testing.
  - Assess impacts of Nuclear Posture Review and End-to-End Reviews.

- Continue the "Nuclear Deterrent Support Program".
- Continue technical support to the Nuclear Weapons Council (NWC) and Joint Advisory Committee (JAC).
- Begin developing third edition of the Nuclear Mission Management Plan.
- Continue developing and presenting tailored nuclear weapons expertise and sustainment modules through Outreach 21 efforts to the War Colleges and operational units.
- Support development of the Nuclear Weapons Stockpile Plan and Requirements & Planning Document.

- Stockpile Operations thrusts:
  - Develop and implement Defense Integration and Management of Nuclear Data Services(DIAMONDS) capability package 3 which includes additional enhancements to Maintenance Bay and Unsatisfactory Reporting System modules
  - Field additional integrated modules based upon user priorities and feedback while continuing to enhance fielded modules.
  - Field 3 additional CONUS nuclear storage sites, begin fielding OCONUS locations with secure communications to support DIAMONDS data transmission and access to stockpile information, tools, and data. Perform additional OCONUS exploratory visits.
  - Field enhanced integrated modules based on user priorities as well as integrated stockpile functions as necessary.
  - Migrate Special Weapons Information Management (SWIM) windows to web based environment for seamless integration with DIAMONDS.
  - Develop and implement initial Electronic Inspection Record Cards (IRC) and Weapon Information Reports (WIR) in DIAMONDS module.
  - Design maintenance scheduling module.
  - Field enhanced integrated modules based upon user priorities as well as integrated stockpile functions as necessary.

FY 2004 Plans

- Nuclear Weapon Surety Thrusts:
  - Conduct modeling and testing to respond to weapon storage facility and weapon system safety requirements and criteria.
  - Initiate a nuclear surety program Indefinite Delivery/Indefinite Quantity ID/IQ for quick response to the emergent threats.
  - Continue storage facility fire suppression project.
  - Complete the development and population of the "Nuclear Surety Information Center", a weapon surety database and interface to utilize and archive completed assessments, studies, tools and test programs.
  - Continue evaluation of enduring stockpile weapons in support of the Air Force and Navy.
  - Continue forensics nuclear activation project with Oak Ridge National Lab.
  - Begin application enhancements of AVERT for Navy and Air Force.
  - Continue Sentry forensics database project.
  - Continue development of electrical system Penetration Tester.

- Begin analyses of abnormal environment scenarios for nuclear weapons systems.

- Stockpile Sustainment Program thrusts:
  - Support annual certification and stockpile stewardship for the continued safety and reliability of the U.S. nuclear stockpile in the absence of underground testing.
  - Continue the "Nuclear Deterrent Support Program".
  - Continue technical support to the Nuclear Weapons Council (NWC) and Joint Advisory Committee (JAC).
  - Complete developing third edition of the Nuclear Mission Management Plan.
  - Continue developing and presenting tailored nuclear weapons expertise and sustainment modules through Outreach 21 efforts to the War Colleges and operational units.
  - Support development of the Nuclear Weapons Stockpile Plan and the Requirements & Planning Document.
- Stockpile Operations thrusts:
  - Development and implement initial maintenance scheduling module
  - Continue with the OCONUS fielding
  - Complete SWIM migration and implementation
  - Field enhanced Joint Nuclear Weapons Publication System (JNWPS), maintenance bay and Inspection Record Card modules.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Combatant Commands/Forces/Security Support	0	7.3	9.0	10.1

FY 2002 Accomplishments

- Funding and activities performed in Project BG are in PE 0602715BR.

FY 2003 Plans

- Maintain USEUCOM/Supreme Headquarters Allied Powers Europe (SHAPE) European Theater Nuclear Support Program to provide in-theater nuclear and WMD support to EUCOM and NATO.
- Continue the War Plans Support Program for the Combatant Commands
  - Objective is to respond to Combatant Commands requests to address counter-WMD challenges within theater war plans; to provide recommended executable solutions based upon detailed, integrated operational analyses with associated technical applications.

- Continue support to STRATCOM and regional Combatant Commands with specific nuclear and WMD threat analysis in support of:
  - Single Integrated Operational Plan (SIOP) preparation
  - Development of integrated effects models
  - Direct planning support to regional Combatant Commands
  - Specified applications for the Deterrence Framework analytic structure.
- Continue to execute the Strategic Deterrence Program to:
  - Support full range of nuclear and WMD Consequence Management Issues
  - Provide nuclear policy support and the assessment of the full range of nuclear/WMD issues for DoD components.
- Conduct Force-on-Force exercise program using the Mighty Guardian series.
- Continue to examine and evaluate the future impacts of technology on political/military/economical trends-focused on WMD/Consequence Management (CM)/Nuclear proliferation.
- Continue to directly support the curriculum development for the Defense Nuclear Weapons School.
- Continue to serve as the DoD Executive Agent for nuclear weapons training and education.
- Continue to develop a comprehensive WMD Training program.
- Continue to expand and enhance expertise outreach training program across DoD.

FY 2004 Plans

- Refocus USEUCOM/SHAPE European Theater Nuclear Support Program to provide in-theater nuclear and WMD support to EUCOM and NATO and toward the war on terrorism.
- Continue the War Plans Support Program for the Combatant Commands
  - Objective is to respond to Combatant Command requests to address counter-WMD challenges within theater war plans; particularly the war on terrorism, to provide recommended executable solutions based upon detailed, integrated operational analyses with associated technical applications.
- Continue support to STRATCOM, the newly formed NORTHCOM, and regional Combatant Commands with specific nuclear and WMD threat analysis in support of:
  - SIOP preparation
  - Development of integrated effects models
  - Direct planning support to regional Combatant Commands
  - Specified applications for the Deterrence Framework analytic structure.
- Continue to execute the Strategic Deterrence Program to:

  - Support full range of nuclear and WMD Consequence Management Issues
  - Provide nuclear policy support and the assessment of the full range of nuclear/WMD issues for DoD components.
- Conduct Force-on-Force exercise program using the Mighty Guardian series.
- Conduct exploratory research on physical security equipment and technology designed to enhance the protection of the nuclear stockpile.
- Continue to examine and evaluate the future impacts of technology on political/military/economical trends-focused on WMD/Consequence Management (CM)/Nuclear proliferation.
- Continue to directly support the curriculum development for the Defense Nuclear Weapons School; program will transition to O&M funding in FY 2004.
- Continue to serve as the DoD Executive Agent for nuclear weapons training and education; program will transition to O&M funding in FY 2004.
- Continue to develop a comprehensive WMD Training program; program will transition to O&M funding in FY 2004.
- Continue to expand and enhance expertise outreach training; program across DoD; program will transition to O&M funding in FY 2004.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2 0602717BR	**PROJECT NAME AND NUMBER:** Project BH – System Survivability	

Cost ($ in millions)	FY 2002	FY 2003	Y 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BH - System Survivability	0	86.5	86.0	90.2	82.1	83.0	82.8	84.0

A. Mission Description and Budget Item Justification:

- These programs directly reflect the National Military Strategy, support the provisions of Joint Vision 2020, and the Nuclear Posture Review, and are directed by the JCS in the Joint Strategic Capabilities Plan (Nuclear Annex). 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; 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.
- Project BH encompasses programs formerly divided into the five business areas: Radiation Hardened Microelectronics, Simulator Technology, Assessments and Protection Technology, Balanced Electromagnetic Hardening, and Human Risk and Technology. These business areas are now divided into four business areas and described below: Radiation Hardened Microelectronics; Simulation Technology, Assessment Technology from the Simulator Technology and Electromagnetics Technology areas, and the Human Survivability area.

- **Radiation Hardened Microelectronics.** 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. The program involves the development and demonstration of radiation-hard, high performance prototype microelectronics to support the availability of radiation-hardened microelectronics and photonics for DoD missions through private sector and government organizations. This is achieved through the development and demonstration of enabling technologies to ensure the continued availability of special materials and radiation-hardened microelectronics and photonic devices.

- **Simulation Technology.** This program is being revised to respond to the Defense Science Board Task Force on Nuclear Effects Simulation, which recommended that DTRA pursue developing some of the capability lost with the moratorium on underground testing. Since the underground testing (UGT) moratorium, simulators have provided the only remaining experimental test bed for the development and validation of radiation-hardened DoD systems. The intensity and fidelity of these simulators do not match that of the UGT testbed, but, through this program, the agency develops, provides and maintains unique DoD radiation test facilities and enabling technologies that are used by the Defense Agencies, the Services and other federal departments (such as DOE) to evaluate the impact of hostile environments on military systems that support missions in the air, on land, at sea, or in space. The program also develops technologies to improve the intensity, fidelity, reliability, reproducibility, and cost effectiveness of existing and future simulators (including radiation sources, power flow and conditioning components, energy storage, diagnostics, instrumentation, other test support equipment, debris shields, and

numerical models and computer codes for radiation sources and pulsed power components and test beds); develops concepts, plans, and risk reduction strategies for affordable next-generation radiation simulators with substantially improved intensity and fidelity; support improvements to the two existing test centers, one at Titan Pulsed Sciences Division in San Leandro, California, and one at the Arnold Engineering Development Center (AEDC) in Tullahoma, Tennessee; installs and characterizes upgrades to the new Decade x-ray simulator and to existing radiation simulators at Titan.

- **Assessments Technology.** The Assessments Technology program provides testable system design protocols and modeling and simulation (M&S) tools for system designers and users of nuclear effects simulators. Includes development and demonstration of hardened system design and test qualification techniques to produce hardware that can be tested without the need for underground nuclear weapon tests. Survivability Assessments is evolving from an emphasis on strategic assessments for nuclear C2 against prompt radiation to Missile Defense Agency (MDA) and Theater assessments, balanced protection of battlespace, critical infrastructure and network protection. It directly responds to warfighter and acquisition program survivability needs by providing solutions, including development of affordable technologies and methodologies for system-level and family-of-system-level assessments, systems hardening, and testing of the effects of nuclear weapons. The program also directly responds to warfighter and acquisition program survivability needs by providing solutions, including development of affordable technologies and methodologies for system-level and family-of-system-level assessments, systems hardening, and testing of the effects of nuclear weapons. Includes end-to-end assessment technologies for nuclear command and control and Tactical Warning/Attack Assessment networks. Develops disturbed environments test sets to simulate scintillation effects on radar and communications system and to simulate the structure for optical and infrared backgrounds, which disrupt space-based and missile defense interceptor sensors. The program also provides the necessary science and technology to develop warfighting systems and DoD mission-related infrastructure survivable in multiple electromagnetic (EM) environments, including nuclear electromagnetic pulse (EMP), high power microwaves (HPM). Designs and develops innovative, low-cost, balanced EM protection and test technologies for weapon systems; C3; and supporting infrastructure systems to the Combatant Commands, Services and other DoD agencies.

- **Human Survivability.** Rapidly develops/converts radiation sensor, dosimetry and biological technologies for integration into real-time forward deployed tools for characterization of radiologically hazardous environments impacting warfighter mission and command/control decisions. Products protect the health and welfare of U.S. service personnel and allied forces by monitoring and improving human survivability in the conduct of necessary operations on the radiological/WMD battlefield or in areas of suspected WMD development or release. Applies lessons learned from the Nuclear Test Personnel Review Program (O&M-funded) to allow warfighters and peacekeepers to quantify/mitigate the risk in post-Cold-War settings (i.e., limited nuclear exchanges, terrorist actions, radiological dispersal weapons, and other radiation risk scenarios) by developing field measurement and dosimetry systems to support military radiological guidelines for the protection of human resources. This provides direct support to warfighters by predicting and quantifying the operational impact of the WMD and conventional battlefield soldier effectiveness on NBC battlefields; providing performance and cost analysis to support the Defense Acquisition Board; and joint efforts with system program offices to apply the Agency's expertise and technologies to specific Service applications.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Radiation Hardened Microelectronics	0	58.4	53.3	54.2

FY 2002 Accomplishments

- Funding and activities performed in Project BH are in PE 0602715BR.

FY 2003 Plans

- Continue initial development of a 0.15-micron radiation-hard, complementary metal oxide semiconductor (CMOS) fabrication process for the accelerated program.
- Complete accelerated program test structure demonstration of 0.25 micron radiation hardened CMOS at BAE Systems and Honeywell.
- Demonstrate a prototype radiation-hard, 0.35-micron mixed signal technology for applications with a 4X increase in performance.
- Complete fabrication of prototype Honeywell and BAE Systems 4/8 million-gate application specific integrated circuit.
- Complete validation of prototype Boeing very deep submicron electronic design automation system.
- Complete demonstration of prototype radiation hardened embedded non-volatile random access memory.
- Demonstrate rad hard SiGe mixed-signal technology.

FY 2004 Plans

- Complete test structure demonstration of radiation-hard 0.15-micron technology for accelerated program at Honeywell and BAE Systems.
- Complete circuit qualification of radiation-hard 0.25 micron technology for accelerated program at BAE Systems and Honeywell.
- Complete testing of Honeywell 16 million bit multi-chip module.
- Complete testing of prototype 64 kilobit focal plane gate array.
- Demonstrate radiation hardened embedded giant magneto resistive non-volatile random access memory technology.
- Complete demonstration of a prototype radiation-hard mixed-signal 0.35-micron deep submicron technology.
- Demonstrate analog and mixed-signal electronic design automation.

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602717BR	**PROJECT NAME AND NUMBER:** Project BH – System Survivability

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Simulation Technology	0	15.8	13.4	15.8

FY 2002 Accomplishments

- Funding and activities performed in Project BH are in PE 0602715BR.

FY 2003 Plans

- Demonstrate 1 Mega-Volt (MV) Fast Marx Generator.
- Develop improved 20-100 KeV simulator capability.
- Demonstrate 40 kJ Ar PRS on Decade Quad.
- Continue customer test support at Titan Pulsed Sciences Division.
- Upgrade and integrate cold x-ray debris shields at the Decade Radiation Test Facility (DRTF).
- Begin replacement of obsolete user and machine instrumentation at the DRTF.

FY 2004 Plans

- Demonstrate Ar/Kr/Xe “Black Body” spectrum on Decade Quad (DQ).
- Demonstrate large area survivable lithium debris shield.
- Improve cold x-ray yield and debris shielding capability by a 3X increase in the fluence – area metric on Decade.
- Continue customer test support at Titan Pulsed Sciences Division (TPSD).
- Begin integration of test capabilities to support Ground Based Missile Defense/Exoatmospheric Kill Vehicle (GMD/EKV) testing.
- Continue replacement of obsolete user and machine Data Acquisition System (DAS) instrumentation at the Decade Radiation Test Facility (DRTF).
- Demonstrate 50% increase in warm x-ray dose rate on Double Eagle (DE).
- Demonstrate 50% increase in hot x-ray dose on DE.

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602717BR	**PROJECT NAME AND NUMBER:** Project BH – System Survivability

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Assessments Technology	0	11.4	18.2	19.1

FY 2002 Accomplishments

- Funding and activities performed in Project BH are in PE 0602715BR.

FY 2003 Plans

- Provide Subject Matter Expert (SME) support to Congressional Commission on Electromagnetic Pulse
- Develop advanced conductive adhesives for High Altitude Electromagnetic Pulse (HEMP)-shielded composite shelters
- Develop Mission Degradation Analysis (MIDAS) model integration methodology.
- Update MIL-STD-188-125 for HEMP Protection of Fixed C4I Facilities and MIL-STD-2169 for the High Altitude Electromagnetic (EM) Pulse environment.
- Assess digital battlespace architectures for susceptibility to EM upset or damage.
- Update MILITARY-HANDBOOK-423, HEMP Protection for Fixed and Transportable Ground Base C4I Facilities. (began in FY 2002).
- Design affordable validation and verification via small scale and high-level testing of High Altitude Electromagnetic Pulse Targeting Application/Source Region Electromagnetic Pulse Targeting Application (HEMPTAPS/SREMPTAP) and Electromagnetic Pulse-Vulnerability Number (EMP-VN) tools for the reliability of the results for the target analysis application.
- Continue populating the EMP-VN and EMP Battle Engagement tool with the appropriate EMP test databases to increase the reliability of the tools. Develop EMP-VN for mobile targets like Air Defense systems for STRATCOM.
- Incorporate the range to effects model for high power E-weapon effects analysis into EMPVN tool and validate the model with test data.
- Complete a major upgrade to EMP/SREMP effects analysis methods and target assessment and planning tools used by warfighters.
- Obtain warfighters' operational approval of EMP/SREMP effects tools.
- Initiate a study of the Integrated Design Environment concept.
- Complete development of System Hardening Upset and Recovery macro cell library of functions application to the GPS system.
- Transition and demonstrate the System Hardening Upset and Recovery macro cell library to the Peregrine foundry.
- Incorporate the System Hardening Upset and Recovery functions into the AF's Improved Space Architecture Concept (ISAC).
- Deliver Testable Hardware Toolkit Version 3.0.
- Complete the first phase development of the thermostructural response (TSR) Toolkit, Version 1.0.

- Continue planning for a joint space sensor system demonstration with NASA.
- Complete fully coupled HPC model for a complex optical telescope experiencing prompt nuclear weapon radiation.
- Continue the cooperative HPC effort with SNL to assist and transfer applicable technology to DTRA's programs.
- Operability Assessments and Disturbed Environment Assessment Technology
- Begin X-Band Radar Nuclear Effects Clutter Simulator (RNECS) Development.
- Complete the Electronic Battle Book (EBB) database to include multiple link assessments due to nuclear weapons detonation for USSPACECOM exercises and assessments.
- Complete USSPACECOM operability assessment of tactical warning/attack assessment (TW/AA) system considering impacts of future Ground Midcourse Defense (GMD) system integration.
- Support GMD hardware-in-the-loop (HWIL) testing.
- Continue development of a Visible Display Simulator to support Spaced Based Infra-Red Systems (SBIRS) Low testing and other future customers.
- Support GMD In-Flight Information Control System (IFICS) testing.
- Develop nuclear environment software modules for integration with HWIL facilities.
- Conduct testing of Early Warning Radars (EWRs) in support of GMD program upgrades. Develop radar disturbance mitigation techniques for GMD Ground-Based Radar and EWRs.
- Provide IR scene testing of MDA sensors.
- Support IR and communications testing of Space-Based Infrared Satellite (SBIRS).
- Continue communication/radar atmospheric effects participation in operational/ warfighting exercises through operational assessments.
- Initiate GMD requirements development support for command and control.
- Complete GMD requirements development support.
- Initiate USSTRATCOM force employment assessment.
- Continue development of nuclear effects keepout algorithms for the GMD Battle Management System.
- Continue to assess the survivability of the GMD Communications Network (GCN) and GMD ground facilities.
- Continue Next Generation Network (NGN) Hard-ware-in-the-loop testbed study of the GCN.
- Continue development of Operability Assessment Tool for Systems (OATS).
- Start integration of OATS with the NGN HWIL Testbed.

- Modify Propagation Effects Radar Simulation (PERSIM) Tool to include MDA/SMD S-Band Radar Model.
- Initiate assessment of the hardening design of the GMD Common Kill Vehicle (CKV).

FY 2004 Plans

- Continue to provide innovative hardening solutions to the National Military Command Center (NMCC)
- Continue development of a Radio Frequency/High Power Microwave military standard/handbook.
- Integrate advanced limiter technology into a sensitive communication receiver in cooperation with the Office of Naval Research.
- Continue to develop integrated EM predictive tools for rapid regional assessments.
- Investigate critical infrastructure interdependency and cascading effects of WMD/advanced EM threats using Next Generation Testbed.
- Update prototype Assessment Interviewer Tools in MIDAS.
- Increase number of effects models integrated into MIDAS.
- Increase number of Critical Infrastructures models integrated into MIDAS.
- Complete the validation of the Nuclear and non-nuclear EMP tools developed for STRATCOM.
- Populate the EMP Tools with adequate and appropriate test databases.
- Complete the Full Operational Capability (FOC) for the STRATCAT tool for STRATCOM.
- Supported IR and communication testing of Space-Based Infrared Satellite (SBIRS).
- Continue development of nuclear effects keepout algorithms for the GMD Battle Management System.
- Continue to assess the survivability of the GMD Communications Network (GCN) and GMD ground facilities.
- Continue Next Generation Network (NGN) Hard-ware-in-the-loop testbed study of the GCN.
- Continue development of Operability Assessment Tool for Systems (OATS).
- Continue integration of OATS with the NGN HWIL Testbed
- Continue replacement of obsolete user and machine instrumentation at the DRTF.
- Continue development of an Integrated Design Environment (IDE) by applying advanced modeling and simulation techniques to system hardness qualification
- Continue development of a COTS operability and survivability protocol for designing and testing systems containing COTS parts.
- Continue assessment of the hardening design of the GMD Common Kill Vehicle (CKV).
- Continue Testable Hardware Toolkit upgrades for Decade facility.

- Use Propagation Effects Radar Simulation (PERSIM) Tool to assess SMD S-Band Radar performance.
- Continue development of a thermostructural response (TSR) toolkit to include impulse loading (Mag Flyer).
- Validate OATS using assessment results from the Next Generation Network (NGN) Testbed.
- Continue communication/radar atmospheric effects participation in operational/ warfighting exercises through operational assessments.
- Support GMD hardware-in-the-loop (HWIL) testing.
- Continue development of a Visible Display Simulator to support Spaced Based Infra-Red Systems (SBIRS) Low testing and other future customers.
- Support GMD In-Flight Information Control System (IFICS) testing.
- Develop nuclear environment software modules for integration with HWIL facilities
- Provide IR scene testing of MDA sensors.
- Continue X-Band Radar Nuclear Effects Clutter Simulator (RNECS) Development.
- Initiate development of the Integrated Design Environment (IDE) Concept by applying advanced modeling and simulation techniques to system hardness qualification.
- Initiate a modeling and simulation effort to maximize the use of increased computer capability (i.e. HPC).
- Develop COTS guideline for developing radiation hardened systems.
- Initiate a Pointman/Pathfinder system demonstration of end-to-end system hardening.
- Examine new and emerging technologies for application in radiation hardened systems.
- Incorporate fault tolerant logic and system applications into the System Hardening Upset and Recovery macro cell library.
- Complete the HPC coupled model for a complex optical telescope under prompt nuclear weapon radiation.
- Complete planning for a sensor system space demonstration with NASA and initiate the demonstration program.

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	0602717BR	**PROJECT NAME AND NUMBER:** Project BH – System Survivability

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Human Survivability	0	0.9	1.1	1.1

FY 2002 Accomplishments

- Funding and activities performed in Project BH are in PE 0602715BR.

FY 2003 Plans

- Continue International Cooperation through The Technical Cooperation Program (TTCP) AG-48 Involvement
- Acceleration of Unmanned Aerial Vehicle (UAV) Based radiological spectroscopy package and add chemical detector. Continue effort on hand-held Rolling Circle Amplification (RCA) based radiobiological dosimeter.
- Continue effort on mobile Electron Paramagnetic Resonance (EPR) device.
- Continue human response effort through the DTRA sponsored Human Response Dose Committee
- Continue support for radiation standards development.
- Continue technology watch and support promising Human Survivability projects.
- Deliver Automated Hematology Analyzers to the Air Force Radiation Assessment Team for incorporation into Field Laboratory for Assessment of Radiation Exposure (FLARE).
- Continue participation in Human Response Steering Committee, The Technical Cooperation Program, and the Arctic Military Environment Cooperation Program.

FY 2004 Plans

- Continue International Cooperation through TTCP AG-48 Involvement
- Complete UAV Project
- Complete Rolling Circle Amplification (RCA) Project.
- Complete EPR Project
- Continue human response effort through the DTRA sponsored Human Response Dose Committee
- Continue support for radiation standards development.
- Continue technology watch and support promising Human Survivability projects.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3	**R-1 ITEM NOMENCLATURE:** Counterproliferation Support 0603160BR

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total 0603160BR Cost	162.6	80.4	76.3	81.8	97.5	103.4	105.4	107.4
Project BB – Small Business Innovative Research	0	.9	1.1	1.1	1.1	1.1	1.1	1.1
Project BJ – SOF Counterproliferation Support	17.2	22.8	23.3	18.8	23.1	19.3	19.7	20.1
Project BK – Counterforce	70.4	56.7	51.9	61.9	73.3	83.0	84.6	86.2
Project BN - Unconventional Nuclear Warfare Defense	75.0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

- The proliferation of nuclear, biological, and chemical weapons and their means of delivery (NBC/M) continues to pose a grave threat to national security. The U.S. requires counterproliferation (CP) counterforce capabilities to neutralize this threat. To accomplish this counterforce mission, the U.S. must be able to identify, characterize and defeat NBC/M research, production, storage, operations and support, and command and control facilities while mitigating collateral hazards resulting from release and expulsion of NBC agents. The potential target set includes fixed, aboveground and underground, hardened and unhardened facilities, as well as transshipment and delivery systems.
- Programs funded through this program element develop, demonstrate, and transition CP counterforce technologies to combatant commands and the Services. The programs are structured to exploit ongoing DoD agency, Service laboratory, and Department of Energy laboratory technology programs wherever possible. The program emphasis is on functional kill as well as hard kill and on mitigating collateral effects. The goal is rapid development of enhanced counterforce mission capabilities to include, but not limited to, advanced conventional and non-conventional (non-nuclear) weapons, application of sensor technologies to provide weapons of mass destruction (WMD) combat assessment, and target-attack planning tools to optimize weapon and sensor employment.
- In addition to counterforce missions, the U.S. requires the capability to defend WMD attacks, particularly the most unsettling and dangerous threat--that 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). The Congressionally-mandated Unconventional Nuclear Warfare Defense (UNWD) program supports this effort by demonstrating an integrated nuclear warfare protection system at the four test-beds established for this purpose. The Unconventional Nuclear Warfare Defense program is a new start since the previous President's Budget Submission.
- Prototype or modified systems integrating these capabilities will then be evaluated in demonstrations--those having military utility transition to a Service for acquisition, and, in some cases, a residual operational capability is provided to combatant commanders. These programs have been grouped into three projects, Special Operation Forces (SOF) Counterproliferation Support (Project BJ), Counterforce (Project BK), and Unconventional Nuclear Warfare Defense (Project BN).

- Starting in FY 2003, the planned milestones will be grouped by program instead of product types to provide a clearer link to the programs included in this program element.

B. Program Change Summary:

($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget	**89.7**	**77.4**	**75.3**	**86.6**
Current President's Budget	**162.6**	**80.4**	**76.3**	**81.8**
Total Adjustments	**72.9**	**3.0**	**1.0**	**-4.8**
Congressional program reduction				
Congressional recissions		**-1.3**		
Congressional increases	**75.0**	**5.0**		
Reprogramming	**-2.1**			
SBIR/STTR Transfer				
Internal Transfer (DoD Defense-Wide)		**-.7**	**3.8**	**-1.8**
Internal Transfer (Within DTRA)			**-2.8**	**-3.0**

Change Summary Explanation:

- The increase of $72.9M to the FY 2002 column from the previous President's Budget Submission to the current President's Budget is the result of two actions.
  - Congress directed and funded the Unconventional Nuclear Warfare Defense (UNWD) program in the amount of $75M. These funds currently reside in project BN.
  - Funding in the amount of $2.1M was reprogrammed from this program element through a below-threshold reprogramming action to support the Agency's Small Business Innovative Research program.
- The net increase in FY 2003 from the previous President's Budget to the current President's Budget is the result of Congressional and Departmental action. Congressional increases to this program amounted to $5M ($5M DERF-Anti-Biological Weapon Defeat Support). Congressional recissions amounting to $1.3M (-$.7M Section 8100–Business Process Reform/Management Efficiencies, -$.2M Section 8109-Reduce Cost Growth of Information Technology Development, and -$.4M Section 8135-Revised Economic Assumptions). The Department also transferred $.7M from this program as part of an OMB inflation adjustment.
- The differences in FY 2004-2005 from the previous President's Budget to the current President's Budget is the result of several Departmental actions as well as internal actions by DTRA. The Department provided DTRA with $5M in FY 2004 in support of DERF requirements. In addition, the Department also transferred $1.2M in FY 2004 and $1.8M in FY 2005 from DTRA to other DoD elements as part of the revised Non Pay Purchase Inflation adjustments. DTRA's internal transfers reflect a carefully balanced program focused on safeguarding America's interest from WMD by

controlling and reducing the threat by providing quality tools and services for the warfighter. Accordingly, resources have been reprogrammed to support critical requirements across the spectrum of combat support, technology development, threat control, and threat reduction mission areas.

- 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

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 0603160BR	**PROJECT NAME AND NUMBER:** Project BB – Small Business Innovative Research

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BB – Small Business Innovative Research	0	0.9	1.1	1.1	1.1	1.1	1.1	1.1

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
  - 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 2002	FY 2003	FY 2004	FY 2005
Small Business Innovative Research (SBIR)	0	0.9	1.1	1.1

FY 2002 Accomplishments

- Supported the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

FY 2003 Plans

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

FY 2004 Plans

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

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 0603160BR	**PROJECT NAME AND NUMBER:** Project BJ – Special Operations Forces (SOF) Counterproliferation Support

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BJ – SOF Counterproliferation Support[1]	17.2	22.8	23.3	18.8	23.1	19.3	19.7	20.1

1 FY 2001 DERF Supplemental provided $15.7M related to this project. Funding is not reflected in this table.

A. Mission Description and Budget Item Justification:

- In 1995, the SECDEF assigned the core task of countering the proliferation of weapons of mass destruction (WMD) to SOF.
- 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)
  - maritime efforts to prevent the spread of WMD technology
  - SOF sponsored Advanced Concept Technology Demonstration (transferred to Project BK in FY 2003)
- Details of this program have been classified per CJCSM 5225-01 dated 23 Oct 1996.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
SOF Counterproliferation Support	17.2	22.8	23.3	18.8

FY 2002 Accomplishments

- Specific details are classified.

FY 2003 Plans

- Specific details are classified.

FY 2004 Plans

- Specific details are classified.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers : FY 2002 funds in the amount of $14.2M and FY 2003 funds in the amount $14.3M have been sent to the United States Special Operations Command (USSOCOM) which is located in Florida. USSOCOM will manage the special operations force counterproliferation projects as executive agent for DTRA. Anticipate funding to be obligated by 30 September 2002 and 30 September 2002 respectively.

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 0603160BR	**PROJECT NAME AND NUMBER:** Project BK – Counterforce

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BK – Counterforce[2]	70.4	56.7	51.9	61.9	73.3	83.0	84.6	86.2

2 FY 2001 DERF Supplemental provided $5.2M related to this project. Funding is not reflected in this table.

A. Mission Description and Budget Item Justification:

- The purpose of this project is to develop technologies, demonstrate prototype systems in an operationally realistic environment, support operators in the definition of the concept of operations, and provide combatant commanders with enhanced capabilities in response to potential adversaries who have the capability to develop and/or employ nuclear, biological and chemical (NBC) weapons of mass destruction (WMD) in future regional conflicts involving the U.S. or its allies. The U.S. requires the capability to attack and neutralize NBC research, production, storage, operations and support, and command and control facilities while mitigating collateral effects resulting from expulsion and release of NBC agents. The potential target sets include fixed, mobile and relocatable, aboveground and underground, hardened and unhardened, and tunnel facilities. The project is structured to exploit ongoing technology programs wherever possible. The project emphasis is on functional kill as well as hard kill and on mitigating collateral effects through advanced weapon development and greatly enhanced target attack planning to optimize weapon employment. The goal is the development of an enhanced counterforce mission capability to include rapid response and penetrating weapons, WMD combat assessment, and the supporting planning tools. Prototype or modified systems integrating these technologies will then be evaluated in demonstrations, and, in some cases, a residual operational capability is provided to combatant commanders.
- This project emphasizes technology demonstrations to include Advanced Technology Demonstrations (ATD) and Advanced Concept Technology Demonstrations (ACTD). The following programs are currently planned: the Second Counterproliferation (CP2) Counterforce ACTD, the Agent Defeat Demonstration, Biological Combat Assessment System (BCAS), SOF Warrior, Advanced Notice ACTD, the Target Defeat (TD) C3I Demonstration, the Thermobaric ACTD, the Standoff High-Speed Option for Counterproliferation (SHOC) (a proposed ACTD), WMD Planning Capability, and the CP Analysis and Planning System (CAPS). Essentially all funds added in this Project, as a result of the Secretary of Defense Strategic Review in FY 2002, are being used to demonstrate technologies identified in the Hard and Deeply Buried Target Defeat (HDBTD) Science & Technology Master Plan. These programs are described in the following paragraphs:
- The CP2 ACTD objective is to develop, demonstrate, and deliver enhanced standoff, counterforce capabilities in conjunction with operational concepts to combatant commanders for planning attacks and timely, reliable defeat of WMD related facilities while minimizing collateral hazards. The CP2 ACTD depends on technology base and products in PE 0602715BR and PE 0602716BR, Projects BD for planning tools and test planning and execution support, and Projects BE for the operational demonstrations. The Navy and Air Force are both participating in weapons and WMD combat assessment system development for the ACTD. The CP2 ACTD has been approved by Deputy Under Secretary of Defense for Advanced Systems and Concepts DUSD(AS&C), and the management plan was signed April 21, 1999. USEUCOM is the operational sponsor with USJFCOM and USSTRATCOM participating. The CP2 ACTD started in FY 1999 and will be completed in FY 2003.
- The Agent Defeat Demonstration is a joint effort with the U.S. Air Force. The objective is to demonstrate and transition an enhanced capability to defeat biological weapons, along with obtaining collateral effects test data and enhancing target planning tools with this data. The program started in

FY 2002. This program responds to the 1994 U.S. Air Force Mission Need Statement for Agent Defeat Weapons. The current payload being developed is called Prompt Agent Defeat (PAD). Agent Defeat depends on the technology base PE 0602715BR and PE 0602716BR, Project BD for weapons phenomenology.

- Biological Combat Assessment System (BCAS) leverages the development work completed and demonstrated for the Chemical Combat Assessment System in FY 2003. BCAS is a new start in FY 2004 and will demonstrate a biological assessment capability that supports CP counterforce missions.

- Standoff High Speed Option for CP (SHOC) is a joint effort with the Navy. This project develops the warhead and target response models for WMD targets. This project starts in FY 2003 and is proposed for an ACTD in FY 2004.

- Special Operation Forces (SOF) Warrior develops specialized SOF technologies and equipment prototypes to detect, disable and render safe and recover critical components from WMD devices in non-permissive and time-sensitive environments. This effort starts in FY 2003.

- WMD Planning Capability develops and demonstrates planning tools to support combatant commanders during exercises an actual operation. This effort transferred from PE 0602715BR in FY 2003.

- The Advanced Notice ACTD has been transferred from Project BJ in FY 2003 to demonstrate enhanced capabilities for the customer, USSOCOM. Advanced Notice integrates existing and developing technologies to produce SOF-focused capabilities for counterproliferation operations against biological warfare production, storage, and weaponization facilities. The objective is to provide to the Geographic Combatant Commander/USSOCOM capabilities, adaptable to other areas of responsibilities (AORs), for counterproliferation activities in response to a country's BW program. The ACTD acts as a forcing function across DoD to develop Joint Doctrine, focusing on SOF capabilities, for counterproliferation of biological warfare infrastructure not vulnerable to attack by conventional forces. Details of this program have been classified per CJCSM 5225-01, dated 23 Oct 1996.

- The TD program objective is to develop and demonstrate end-to-end capabilities for the functional defeat of hard targets, particularly tunnels, and assess developing weapon and sensor concepts against such targets. The program does not develop new sensors; it assesses existing or emerging technologies being developed by others. The TD program develops technologies under PE 0602715BR and PE 0602716BR, Project BF and transitions them to this program for demonstration. The demonstrations require test planning and execution support from PE 0602715BR, Project BE, or from PE 0602716BR starting in FY 2003. The currently planned TD C3I Demonstration ends in FY 2003. TD customers are USPACOM, USSTRATCOM, USSOCOM, and the Air Force's Air Combat Command.

- The Thermobaric ACTD will develop a weapon concept that is based on a new class of thermobarics. Thermobarics include a broad range of high-energy density materials that are capable of producing high temperatures ("thermo") and high pressures ("barics") for extended periods of time. This technology develops the potential for producing sustained, distributed damage in hard targets. The weapon could be used against certain type of tunnel targets for a maximum functional kill of the tunnels. Prototype weapons will be tested under operational conditions for their performance, and leave-behinds will be delivered to the customer.

- The Counterproliferation Analysis and Planning System (CAPS) program responds to the need for a comprehensive and timely counterproliferation (CP) target planning tool to assist combatant commanders in the conduct of their Concept of Operations Plan (CONPLAN) 0400 targeting responsibilities. Products from CAPS include end-to-end descriptions of country specific Nuclear, Biological, Chemical, and Missile (NBC/M) programs of proliferation concern. The analysis provides combatant commanders highly detailed assessments of a country's NBC/M programs, and proliferation pathways, and identifies the critical nodes and key facilities that, if eliminated, would cause the greatest impact to that program. This information will directly support the combatant commanders in the planning and execution of their CP missions. These analyses are conducted in successive levels of detail, identified as Level 1-5 analysis, with Level 1 having the lowest analytical detail and Level 5 the highest. As an output of the analyses, CAPS will provide CP target planners with the critical data elements needed to take effective action against the NBC/M programs of proliferating countries, and will also predict whether there will be environmental consequences (hazards) produced by these actions.
- There are five major aspects of the CAPS program:
  - The integration of intelligence and NBC/M production process analyses to create highly-detailed models of the proliferation efforts underway in selected countries, identifying the specific function and location of the major production sites, and developing detailed layouts of these sites within each country.
  - Element analyses of each country model to select the critical nodes in the country's proliferation pathway. Critical nodes will include those facilities essential to research, production, weaponization, and storage, which if eliminated, would require extended time to replace and significantly degrade the NBC/M program being analyzed (Level 1-3 analysis).
  - Conduct highly detailed inside-the-building analysis necessary for the employment of precision-guided munitions or special operations forces (Level 4-5 analysis).
  - The execution of consequence analyses to determine and to quantify the level of damage that might occur as a result of potential interdiction/counterforce actions, to include: possible casualties, economic losses, and other environmental issues.
  - The completed CAPS analyses will be provided via secure means to the user community in a logical, user-friendly format incorporating the latest advances in computer software development. The Counterproliferation Mission Support Senior Oversight Group and its Requirements Subcommittee, comprised of OSD, JCS, and CINC J-2/3/5 representatives have identified 45 NBC/M programs in 16 different countries as the requirements basis for CAPS analysis.

- The planned programs provide products in five areas: WMD combat assessment, collateral effects prediction, target response, weapons, and operational demonstrations. These product areas are described in the following paragraphs:

- **WMD Combat Assessment.** This product area has evolved from the former (completed in FY 1998) Counterproliferation 1 (CP1) ACTD sensor product area to provide WMD combat assessment capabilities. Product area efforts will provide improved warfighting capabilities against the spectrum of WMD-related facilities. These efforts will leverage existing programs to (1) evaluate near-term technologies; (2) define concepts of operation and system architecture for chemical combat assessment; (3) produce data fusion and mission planning modules to meet user requirements on existing platforms; and (4) integrate chemical and biological combat assessment capabilities onto delivery systems, such as unmanned air vehicle (UAV) and expendable mini-UAV platforms. Further, the effort will demonstrate the ability to confirm, identify, and assess the release of biological/chemical agents in support of attacks on NBC 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 sensors, but will leverage ongoing chemical 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) will be demonstrated. The feasibility of a Biological Combat Assessment System (BCAS) is being studied in FY 2003. BCAS is an airborne Biological BDA capability that provides near real-time analysis to determine if a biological agent has been released following a counterforce attack on adversary biological production and storage facilities. The BCAS system is intended to transition to an ACTD program in FY 2004 under a phased program approach: Phase 1 (FY 2004-2005) – cloud standoff detection with point biological sample collection; Phase 2 (FY 2006-2007) – cloud standoff detection with point biological sample collection and identification; Phase 3 (FY 2008-2009) – cloud standoff detection and biological identification and with point biological collection and identification.

- **Collateral Effects Prediction.** The collateral effects effort provides predictive tools for a variety of applications supporting Nuclear, Biological and Chemical (NBC) target attack planning to include NBC expulsion and dispersion resulting from attacks on WMD facilities as well as acts of terrorism and hostile use of WMD. Requirements include high-resolution weather models, weather measurement systems, and population databases. A key element in developing these collateral effects codes is chemical/biological expulsion tests and modeling. Modeling of chemical/biological expulsion sources will be based on theoretical models and empirical data. Codes will be validated from existing data, other predictive models and special collateral effects experiments. The collateral effects tools will provide pre-attack prediction and post-attack assessment.

- The Hazard Prediction and Assessment Capability (HPAC) is a major product that predicts the release and transport of NBC materials and the subsequent collateral effects. The high-resolution weather prediction capability, another area of emphasis in the product area, will provide timely wind, cloud, and precipitation data necessary for more detailed NBC collateral effects predictions. These tools will also be integrated into the target attack planning tools to assess the consequences of attacks on WMD facilities.

- **Target Response.** This effort will provide a new target attack planning, combat assessment capability and a major upgrade for existing theater-level planning capabilities for defeating or denying NBC facilities and capabilities. This effort builds upon the Integrated Munitions Effects Assessment (IMEA) planning tool developed for CP1 ACTD. IMEA provides a forward deployable, target planning capability for NBC targets. IMEA is an integration of the Munitions Effects Assessment (MEA) tool providing targeting solutions using conventional weapons for a variety of structures and equipment and the HPAC developed under the Collateral Effects Prediction product area. The integrated capability supports the warfighters in the attack planning phase with target response and collateral effects prediction, and in the post-attack phase with combat assessment and re-strike decision support. Upgrades to IMEA for the CP2 ACTD include additional target types (including complex facilities), additional weapons as developed in the Weapons area below (including multiple weapon effects), additional platforms, more operator-friendly displays, more WMD material types, weather interfaces and sources, and more detailed weapon input parameters (such as angle of attack). The ultimate CP2 IMEA product will be able to run stand-alone or in a web-based client-server distributed architecture as it migrates into the Integrated Target Planning Tool Set (ITPTS) suite of tools, the second deliverable during CP2. The ITPTS will provide a spectrum of planning and assessment capabilities from deliberate to crisis. ITPTS provides the warfighter a standardized weaponeering framework that greatly increases weaponeering efficiency and fidelity while minimizing warfighter training requirements. It expedites cross service/coalition weaponeering and joint planning. The ITPTS architecture provides the warfighter with cross platform interoperability and a common look and feel, independent of weapon or target. In addition, it provides the warfighter critical decision support services for all target classes including those associated with weapons of mass destruction. ITPTS will also predict weapons performance and associated NBC collateral effects, develop targeting solutions that minimize collateral effects, and provide results through appropriate interfaces for a variety of targets including functionally and structurally complex facilities. ITPTS will provide an enhanced seamless interface to the Intelligence Community (IC) data sources. ITPTS will be the weaponeering segment in the Joint Targeting Toolbox (JTT) and provides the warfighter with targeting information in a JTT's "Electronic Target Folder" (ETF). This effort will execute a full verification and validation program, in accordance with the Joint Technical Coordinating Group for Munitions Effects (JTCG/ME) Procedures, for all delivered capabilities including extensive verification testing and operational and field testing at all functional levels.

- **Weapons.** This product area will develop, integrate and demonstrate advanced conventional weapons technologies to improve mission effectiveness against NBC targets while mitigating collateral effects. The focus for CP2 ACTD is to provide combatant commanders with a demonstrated option to attack NBC facilities in a standoff mode. This effort will improve on existing standoff weapon platforms to provide enhanced penetration and advanced fuzing developed during CP1. Standoff weapons to be enhanced include the Tactical Tomahawk in a penetrator variant and the Conventional Air Launched Cruise Missile (CALCM). An enhanced payloads project explores alternate warhead options to conventional blast/fragmentation with the objective of mitigating collateral effects associated with dispersal of NBC. Target Defeat (TD) will demonstrate non-conventional (non-nuclear) weapons to functionally defeat tunnels. TD weapons technology being developed includes advanced energetics (like thermobarics) and non-energetics for functional defeat of HDBTs. The proposed SHOC ACTD will develop and demonstrate a supersonic cruise missile system capable of rapidly destroying or functionally defeating/denying fixed WMD facilities as well as soft WMD facilities, including relocatable facilities, logistics systems, and delivery systems.

- **Operational Demonstrations.** This product area will improve the operational capability for holding NBC targets at risk with minimum collateral effects. The objective is to integrate available or near-term technologies for WMD combat assessment, weapons, collateral effects prediction, and target planning tools, to evaluate the technologies in an operational context, and to transition improved capabilities rapidly to combatant commands. Specifically, this product area will enhance and accelerate existing programs to provide integrated target planning, collateral effects prediction codes, a Chemical Combat Assessment System (CCAS) and advanced weapons to meet NBC target defeat requirements. This product area will also support demonstration operations to include system operational concept, demonstration planning, scenario development, execution of the demonstration, and post-demonstration analysis. Planning and execution of demonstrations use a time phased approach to screen candidate technologies for maturity, develop prototype systems and demonstrate enhancements in military capability against a combatant command prioritized subset of all potential NBC target types. This approach results in a cycle of prototype development and testing followed by periods of operational demonstration.

- Three operational demonstration series are planned for CP2 ACTD over the period of FY 2000-2003 to provide the operational sponsor, United States European Command, and participating commands with the opportunity to assess the utility of the selected technologies. The objective of the first demonstration series in CP2 ACTD, called Dipole Yukon (DY), is to demonstrate the capability to plan and execute chemical/biological (C/B) counterforce missions with the Joint Air-to-Surface Standoff Missile (JASSM) through operationally realistic attacks against a simulated biological weapons storage facility. The objective of the second demonstration, called Dipole Zodiac (DZ), is to assess the suitability of the CALCM with a penetrating warhead and a Predator unmanned air vehicle (UAV) based standoff collateral effects assessment system. The objective of the third demonstration series, called Divine Canberra (DC), is to evaluate the end-to-end set of products of the CP2 ACTD including the target planning tool, in its final operational context, the Tactical Tomahawk Penetrator Variant (TTPV), and remote combat assessment using a small expendable mini-UAV with a chemical point detector on-board (and deployed from the Predator UAV demonstrated in DZ) against a hard chemical production and storage facility.

- TD will conduct a functional defeat demonstration on a Command, Control, Communications, and Intelligence (C3I) tunnel facility using improved target planning tools and new weapon concepts. The currently planned demonstration ends in FY 2003.

- The Thermobaric ACTD will leverage existing concepts and work in energetic payload technology to weaponize, demonstrate, and deliver an improved weapon system for the functional defeat of tunnels targets. Three operational demonstrations are planned in FY 2005 against an operationally representative underground facility complex. The demonstrations will lead to a military utility evaluation conducted by the operational sponsors, United States Pacific Command and United States Forces Korea. The evaluation will assess the end-to-end ability of an improved weapon system to functionally defeat an underground facility complex.

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
WMD Combat Assessment (CCAS/BCAS)	9.1	.5	2.3	11.2

FY 2002 Accomplishments

- Integrated FINDER mini-unmanned air vehicle (UAV) on Predator and flight test.
- Exercised Chemical Combat Assessment System (CCAS) Predator standoff system and mini-UAV point detector at Dipole Zodiac.
- Continued Divine Invader test series with integrated CCAS.
- Began training of operators on integrated CCAS.
- Began feasibility study for a Biological Combat Assessment System (BCAS).

FY 2003 Plans

- Complete Divine Invader test series with integrated CCAS.
- Complete Training of operators on integrated CCAS.
- Complete feasibility study for a Biological Combat Assessment System (BCAS).
- Complete Divine Canberra Demonstrations 1 and 2.
- Transition CCAS residuals to customer.

FY 2004 Plans

- Prepare CCAS for US Air Force System Development and Demonstration (SDD) program start in FY 2005.
- Support CCAS residuals and training programs.
- Begin Biological Combat Assessment System (BCAS) ACTD program, Phase 1.

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 0603160BR	**PROJECT NAME AND NUMBER:** Project BK – Counterforce

Cost ($ in thousands)	FY 2002	FY 2003	FY 2004	FY 2005
Collateral Effects Prediction	3.5	Realigned	0	0

FY 2002 Accomplishments

- Completed chemical source term validation testing for demonstration
- Delivered final hazard source models for CP2 ACTD standoff weapons
- Developed initial ensemble weather forecasting for planning tools
- Provided Hazard Prediction and Assessment Capability (HPAC) modules for Integrated Target Planning Tool Set (ITPTS) 2.0 to meet USEUCOM final product requirements
- Delivered and validated HPAC 4.1 for Dipole Zodiac and Dipole Yukon

FY 2003 Plans (Realigned to CP2 ACTD)

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Target Response	4.5	Realigned	0	0

FY 2002 Accomplishments

- Validated Integrated Munitions Effects Assessment (IMEA) 5.0 software to support Dipole Zodiac and Dipole Yukon 2 (JASSM).
- Delivered TTPV and CALCM weapon effects/performance models.
- Delivered ITPTS 2.0 that includes access to additional IC data sources and interface to other targeting tools through the Joint Targeting Toolbox (JTT) and Electronic Target Folder (ETF).
- Completed the first phase of the integration of WinJMEM into ITPTS, begin integration of the Joint Technical Group for Munitions Effects (TCG/ME) Air-to-Surface Weaponeering System (JAWS) into ITPTS.
- Continued IMEA C3I facility model validation testing.
- Performed sub-scale validation tests to support the CP2 full-scale operational tests.
- Began the IV&V of ITPTS 2.0 and submit the Accreditation Support Package (ASP) to the JTCG/ME for accreditation.
- Completed the integration of the JTCG/ME weaponeering product WinJMEM into ITPTS.
- Completed the IV&V of MEA 5.0 support the CALCM and JASSM demonstrations in CP2 ACTD and submit the Accreditation Support Package (ASP) to the JTCG/ME for accreditation.

FY 2003 Plans (Realigned to CP2 ACTD)

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
CP Analysis and Planning System	12.1	9.1	9.3	9.4

FY 2002 Accomplishments

- Completed the second round of Counterproliferation Analysis and Planning System (CAPS) analytical production on 30 September 2002:
  - Level 1-3 analysis on the remaining six CP Mission Support Senior Oversite Group (MS SOG) near-term country programs
  - Level 4 analysis of not less than 40 facilities
  - Level 5 analysis of a minimum of 5 facilities.
- Continued CAPSNET terminal installations at major commands, priority supporting commands, and support agencies; installations in advanced planning for FY 2002 are EUCOM (JAC), USFK (PACOM), DIA, WINPAC (CIA), and SOUTHCOM. Other potential CAPSNET installations for FY 2002 are JFCOM (CMSALANT/JFIC), EUCOM (Stuttgart/Ramstein), and potentially other supporting organizations.
- Upgraded SIPRNET connectivity to a full T-1 line with a 2nd T-1 line planned.
- Installed Joint Worldwide Intelligence Communications System (JWICS) CAPS server at Lawrence Livermore National Laboratory (LLNL), providing more up-to-date information than was currently available to CAPS users on JWICS.

FY 2003 Plans

- Initiate third CAPS production cycle, 01 October 2002 – 31 March 2003, with specific requirements to be determined by the CP MS SOG Principals, Requirements Subcommittee, and representatives of the combatant commands in coordination with the CAPS program managers.
- Further expand CAPS analysis in designated counties to support the Multi-Layered Analysis (MLA) work as identified by the Intelligence Community.
- Pursue hosting CAPSNET on JWICS using Secure Community of Interest (S/COI) Software. This will provide the full CAPS analysis, Level 1-5, and much easier access to the Intelligence Community and other JWICS users.
- Transition of CAPS data to a relational database to further enhance integration with intelligence databases and DoD modeling tools.
- Complete any remaining CAPSNET terminal installations.

FY 2004 Plans

- Initiate fourth CAPS production cycle, 01 April 2003 – 30 September 2004, with specific requirements to be determined by the CP MS SOG Principals, Requirements Subcommittee, and representatives of the combatant commands in coordination with the CAPS program managers.
- Further expand CAPS analysis in designated counties to support the Multi-Layered Analysis (MLA) work as identified by the Intelligence Community.
- Further expand the integration of CAPS analysis with DoD modeling capabilities to enhance deliberate planning.
- Expand CAPS users to US allies where deemed appropriate by the CP MS SOG Principles.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Weapons	10.9	Realigned	0	0

FY 2002 Accomplishments

- Conducted Tactical Tomahawk Penetrator Variant (TTPV) critical design review.
- Completed TTPV penetrator warhead design, fabrication, and test.
- Completed TTPV penetrator systems integration.
- Completed TTPV penetrator command and control modifications.
- Conducted TTPV penetrator payload system design, missile systems design and engineering, and air-vehicle modification design and fabrication.
- Conducted TTPV penetrator system test and evaluation.
- Completed design and effectiveness studies for the Hard and Deeply Buried Target Defeat (HDBTD) classified weapon concept.

FY 2003 Plans (Realigned to CP2 ACTD)

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Operational Demonstrations	9.8	15.6	.8	.8

FY 2002 Accomplishments

- Conducted Dipole Zodiac (1 and 2) Conventional Air Launched Cruise Missile (CALCM) and Unmanned Air Vehicle (UAV) demonstrations and analyze results.

- Conducted Dipole Yukon 2 (JASSM) demonstration and analyze results.
- Initiated target refurbishment for Divine Canberra demonstration and Dipole Zodiac demonstrations.
- Initiated C3I demonstration for the HDBTD classified weapon concept.
- Developed testbed to provide necessary demonstration and validation capability for new hard and deeply buried target defeat technologies.
- Completed payload plan and weaponization plan for Thermobaric Weapon (TW) demonstration.
- Initiated integration of thermobaric payload material with weapon system and firing system.

FY 2003 Plans

- Conduct Midway Blue 1,2 and 3 demonstrations for the Advanced Unitary Penetrator.
- Complete target refurbishment for Divine Canberra and Dipole Zodiac demonstrations.
- Conduct Dipole Zodiac 2 demonstration for CALCM.
- Conduct Divine Canberra 1 and 2 demonstrations for TTPV, CCAS, and planning/analysis tools.

FY 2004 Plans

- Provide residual support to CP2 ACTD products.

Cost ($ in thousands)	FY 2002	FY 2003	FY 2004	FY 2005
CP2 ACTD	0	13.8	0	0

FY 2002 Accomplishments

- Funding was not realigned to this subproject until FY 2003.

FY 2003 Plans

- Complete Divine Invader flight-testing of CCAS.
- Deliver and validate final version of HPAC incorporating CP2 ACTD hazard source models.
- Deliver and validate final version of IMEA incorporating CP2 ACTD weapons effects data.
- Deliver and validate final version of ITPTS incorporating CP2 ACTD requirements.
- Complete Divine Canberra (DC) demonstration and analyze results.
- Support USEUCOM's military utility assessment of all CP2 deliverables.

- Deliver residual capabilities to CINC sponsor, USEUCOM.
- Deliver and validate HPAC 4.1 for final ACTD demonstrations. This version increases functionality of planning tools not specifically addressed, such as industrial chemical and nuclear facilities
- Develop chemical source terms as required for demonstrations and planning exercises
- Train HPAC to Combatant Command staff personnel
- Complete TTPV penetrator payload system design, missile systems design and engineering, and air-vehicle modification design and fabrication.
- Conduct TTPV penetrator system test and evaluation.
- Conduct TTPV Flight Event Demonstrations.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
WMD Planning Capability	0	1.5	1.5	0

FY 2002 Accomplishments

- Funding and activities performed in Project BF are in PE 0602715BR.

FY 2003 Plans

- Produce Synthetic Exercise Environment (SEE) database and cartographic products for SHAPE Able Ally FY 2003 exercise.
- Implement SEE Atlantis digital terrain mapping enhancements for EUCOM.

FY 2004 Plans

- Produce SEE database and cartographic products for SHAPE Able Ally FY 2004 exercise.
- Continue Warfighter Planning Support (WPS) priority analytical support for combatant commands as coordinated by customers.

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 0603160BR	**PROJECT NAME AND NUMBER:** Project BK – Counterforce

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Agent Defeat	1.0	1.1	7.1	4.2

FY 2002 Accomplishments

- Initiated Prompt Agent Defeat (PAD) project.
- Started scale tests for agent neutralization.
- Completed four small-scale tests for agent neutralization.
- Initiated non-energetic agent defeat program-Classified.

FY 2003 Plans

- Completion of small-scale optimization for PAD.
- Begin Full-scale design for PAD weapon.
- Complete initial laboratory phase of non-energetic agent defeat program
- Begin standardized bioassay program.

FY 2004 Plans

- Full-scale demonstration of PAD weapon.
- Continue non-energetic agent defeat optimization/weaponization.
- Deliver modeling capability for PAD weapon.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Advanced Notice ACTD	7.4	8.5	8.0	6.0

FY 2002 Accomplishments

- Specific details are classified.

FY 2003 Plans

- Execute Final Demonstration in June 2003.
- Execute smooth transition of residuals that demonstrated military utility in the exercise.
- Further details are classified.

FY 2004 Plans

- Enhance capabilities identified in the demonstration.
- Initiate follow-on demonstration.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
SOF Warrior	0	.9	4.5	8.5

FY 2003 Plans

- Complete SOF portion of C3I demonstration for the Hard and Deeply Buried Target Defeat (HDBTD) classified weapons.
- Perform Analysis of Alternatives (AoA)
- Identify and select specific technologies that will be pursued in Phase 1.
- Conduct operational assessment of selected candidate technologies by user/customers.
- Develop program plans and spend plans for the activity and each technical area
- Start specific kick-off meetings for technologies funded under each technical area
- Specific details are classified.

FY 2004 Plans

- Conduct individual technology testing
- Determine military utility assessment test protocol
- Conduct Integrated Project Reviews (IPR) for each technology
- Conduct second technology review and AOA
- Develop Early User Test and Evaluation (EUT&E) test bed
- Specific details of individual technologies will be SECRET SPECAT

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
HTD C3I Demonstration	0	2.0	0	0

FY 2003 Plans (NEW)

- Complete C3I demonstration for the HDBTD classified weapons.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Thermobaric ACTD	12.1	2.7	12.4	8.0

FY 2002 Accomplishments

- Initiated construction of full-scale underground facility target complex at White Sands Missile Range (WSMR).
- Completed a feasibility study for alternative warhead case designs.
- Completed small-scale bombproof testing of explosive candidates.

FY 2003 Plans

- Develop Thermobaric explosive models to support mission planning/analysis tools.
- Conduct sub-scale testing of Thermobaric explosive candidates.
- Complete construction of full-scale underground facility target complex.
- Conduct full-scale validation testing.
- Complete warhead design and fuze integration evaluations.

FY 2004 Plans

- Conduct weapon qualification tests
- Initiate weapon flight qualification testing.
- Develop weapon modules for mission planning/analysis tools.
- Produce test assets for TB ACTD Operational Demonstration (DISCRETE FORTUNA).

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 0603160BR	**PROJECT NAME AND NUMBER:** Project BK – Counterforce

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Standoff High-Speed Option for Counterproliferation (SHOC)	0	1.0	6.0	13.8

FY 2003 Plans

- Initiate Standoff High-Speed Option for Counterproliferation (SHOC) project.
- Conduct Military Utility Study of SHOC concept.
- Develop and release request for proposals for ACTD.

FY 2004 Plans

- Initiate ACTD
- Award contract (s) for SHOC system development.
- Conduct program kickoff meetings with ACTD performers.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: Over $12M of FY 2002 funding was provided to the Navair Program Executive Officer. This funding was ultimately placed on contract with Raytheon Missile Systems Co., in support of the Tactical Tomahawk Penetrator Variant program.

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA 3 0603160BR	**PROJECT NAME AND NUMBER:** Project BN – Unconventional Nuclear Warfare Defense

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BN – Unconventional Nuclear Warfare Defense	75.0	0	0	0	0	0	0	0

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). In July 2001, the Defense Science Board (DSB) Task Force Report on Unconventional Nuclear Warfare Defense further elaborated on this increasing threat to the U.S. To defend against this threat, Congress commended the DSB report and directed the Unconventional Nuclear Warfare Defense (UNWD) program and funds to restore the historic balance between operational needs and sustaining R&D investments within the nuclear search arena in the FY 2002 DoD Appropriation. 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. UNWD, as authorized, is a joint DTRA-NNSA program directed to demonstrate integrated nuclear warfare protection systems at the four test-beds established for this purpose. The Terrorist Device Defeat (TDD) program is being used to restore the historic balance between operational needs and sustaining R&D investments.

B. Accomplishments/Planned Program:

Cost ($ in thousands)	FY 2002	FY 2003	FY 2004	FY 2005
Unconventional Nuclear Warfare Defense*	75.0	0	0	0

***Funding received in July 2002, FY 2003 plans will utilize FY 2002 funding**

FY 2002 Accomplishments

- Establish a UNWD test bed at Kirtland AFB, New Mexico. Demonstrate prototype system using available technology and exercise a concept of operations (CONOPS) for response.
- Prepare UNWD test beds at Naval Submarine Base Kings Bay, Georgia; Camp Lejeune, North Carolina; and Ft. Leonard Wood, Missouri for operation and demonstrations.

FY 2003 Plans

- Establish a UNWD test bed at Naval Submarine Base Kings Bay, Georgia. Refine and demonstrate prototype system using available technology and exercise a CONOPS for response.
- Establish a UNWD test bed at Camp Lejeune, North Carolina. Continue to refine and demonstrate prototype system using available technology and exercise a CONOPS for response.
- Establish a UNWD test bed at Ft. Leonard Wood, Missouri. Continue to refine and demonstrate prototype system using available technology and exercise a CONOPS for response.

  Note: The Department is currently in the process of reprogramming a portion of FY 2003 funding that was appropriated as O&M funding for this effort to the RDT&E appropriation.

FY 2004 Plans (This is a Congressionally-directed program; at this time no funds have been authorized or appropriated for FY 2004 and beyond.)

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: $25M of FY 2002 funding was provided to the National Nuclear Security Administration located in New Mexico in support of the Unconventional Nuclear Warfare Defense Program.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA	**R-1 ITEM NOMENCLATURE:** Arms Control Technology 0603711BR

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total 0603711BR Cost	60.2	43.5	4.8	14.2	14.8	21.8	24.5	25.0
Project BB – Small Business Innovation Research (SBIR)	2.4	1.0	1.0	1.0	1.0	1.0	1.1	1.2
Project BI – Arms Control Technology	57.8	42.5	3.8	13.2	13.8	20.8	23.4	23.8

A. Mission Description and Budget Item Justification:

- This program element (PE) provides research, development, test, and evaluation (RDT&E) to meet technology requirements in support of implementation, compliance, monitoring and inspection for existing and emerging arms control treaties and agreements. Efforts under this PE also support international peacekeeping and nonproliferation objectives. Current and emerging technologies are assessed to provide the basis for research and development investment decisions, evaluate existing programs, and provide the technical input required to make compliance judgments and support U.S. Arms Control policy formulation and negotiating teams. Selected technologies are developed and demonstrated to support confidence building measures and nonproliferation initiatives to ensure that capabilities to monitor, comply with, and implement treaties and agreements are available when required.

- Specific products include equipment and procedures for data exchanges, on-site and aerial inspections and monitoring, and off-site analysis required to meet treaty specifications and implement confidence-building measures. Where applicable, RDT&E to meet requirements in one area is applied to fulfill requirements in other areas to maximize return on investment.

B. Program Change Summary:

($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget	62.9	37.6	41.7	41.7
Current President's Budget	60.2	43.5	4.8	14.2
Total Adjustment	-2.7	5.9	-36.9	-27.5
Congressional program reductions	-.1	-1.5		
Congressional recessions		-.6		
Congressional increases		8.3		
Reprogrammings	1.0			
SBIR/STTR Transfer				
Internal Transfer (DoD-Wide)	-3.6	-.3	-24.8	-15.1
Internal Transfer (Within DTRA)			-12.1	-12.4

Change Summary Explanation:

- The decrease reflected in the FY 2002 column from the Previous President's Budget to the current President's Budget is the result of several actions. To support P.L. 107-67 Section 629 to support "Policy and Operations", $100K was reduced from this program element. Below-threshold actions amounting to $983K were added to this program element to support the execution of DTRA's, Small Business Innovative Research Program. DTRA was directed by the Department to provide, on a 'Fair Share" basis, $3.333M dollars to support a Broad Agency Announcement in support of Combating Terrorism, which was funded from this program element.
- The increase reflected in the FY 2003 column from the Previous President's Budget to the current President's Budget is the result of Congressional adds in the amount of $8.3M (+$3M DERF-CBRNE Sensor and Info Fusion, +$1M Early Warning Detection using metal oxide, and +$4.3M Innovative Tech/Industry-Based research). This PE also received a Congressional reduction in the amount of $1.5M, and Congressional recissions in the amount of -$.6M (-$.3M Section 8100-Business Process Reform/Management Efficiencies, -$.1M Section 8109- Reduce Cost Growth of Information Technology Development, and -$.2M Section 8135-Revised Economic Assumptions). The Department also transferred $.3M from DTRA from this PE as part of an OMB inflation adjustment.
- The decrease in FY 2004-2005 from the Previous President's Budget to the current President's Budget is the result of several actions. The internal transfers within DTRA are the result of DTRA's internal Program Review and reflects a carefully balanced program focused on safeguarding America's interest from WMD by controlling and reducing the threat by providing quality tools and services for the warfighter. Accordingly, resources have been reprogrammed to support critical requirements across the spectrum of combat support, technology development, threat control, and threat reduction mission areas. Starting in FY 2004, the Nuclear Arms Control Technology Program and associated resources are transferred from the DTRA to the Army and Air Force. DTRA, the Army, and the Air Force have agreed to this transfer, with the basic seismic portion of the Nuclear Arms Control program being transferred to the U.S. Air Force; and the remainder of the Nuclear Arms Control program which includes the R&D program covering information fusion, test bed activities (Center for Monitoring Research activities) sensor design, and associated O&M and

Procurement funding being transferred to the U.S. Army Space and Missile Defense Command in Huntsville, Alabama. The Under Secretary of Defense (AT&L) has approved this transfer (RDT&E transferred FY 2004 -$14.5M and FY 2005 -$14.4M). In FY 2004, the Department also transferred $10M from this PE to meet higher priority, departmental requirements.

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

D. Acquisition Strategy: N/A

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development – BA3 0603711BR	**PROJECT NAME AND NUMBER:** Project BB - Small Business Innovative Research (SBIR)

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BB – Small Business Innovation Research (SBIR)	2.4	1.0	1.0	1.0	1.0	1.0	1.1	1.2

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 thousands)	FY 2002	FY 2003	FY 2004	FY 2005
Small Business Innovation Research	2.4	1.0	1.0	1.0

FY 2002 Accomplishments
- Supported the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.
- Executed Agency-approved SBIRs.

FY 2003 Plans
- Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.
- Execute Agency-approved SBIRs.

FY 2004 Plans
- Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.
- Execute Agency-approved SBIRs.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers: None

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development – BA3 0603711BR	**PROJECT NAME AND NUMBER:** Project BI - Arms Control Technology

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BI – Arms Control Technology	57.8	42.5	3.8	13.2	13.8	20.8	23.4	23.8

A. Mission Description and Budget Item Justification:

- This project provides an integrated and comprehensive approach to meeting the technology requirements associated with achieving national defense nonproliferation and arms control objectives. The major activities consist of the following:
- Develop procedures and equipment that will enable the USG to effectively exercise treaty inspection rights, monitor compliance, and accomplish reporting associated with current and projected treaty requirements in the most non-intrusive and cost-effective manner. Objectives include achieving more effective methods of measuring characteristic Treaty-Accountable Item signatures (e.g. for non-deployed missiles and warheads in all life-cycle phases, to include conversion and/or elimination) utilizing technologies based on physical principles such as nuclear radiation detection, acoustics, or chemical identification and providing monitoring/inspection capabilities to reduce the overall cost and increase the flexibility of U.S. inspectors.
- Develop technology to provide information collection, processing and dissemination capabilities required for compliance assessments and to meet notification and reporting requirements associated with evolving treaties and agreements (e.g., new rules for counting strategic forces).
- Develop technology to support revised implementation and compliance requirements resulting from the decisions of the Conventional Armed Forces in Europe (CFE) Joint Consultative Group; the Organization for Security and Cooperation in Europe (OSCE)Forum for Security Cooperation; North Atlantic Treaty Organization (NATO) Verification Coordinating Committee and the High Level Task Force; the Conference on Disarmament; the Multilateral Working Group on Arms Control and Regional Security; the Wassenaar Arrangement; and the Open Skies Consultative Commission (OSCC).
- Perform technology assessments and provide technical input to support development of innovative agreements addressing arms control issues in new topical areas and/or specific geographical regions.
- Develop and validate technologies that ensure on-site sampling and analysis is effective and that DoD equities are protected during the course of all inspections/visits conducted under the convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on their Destruction.
- Develop technologies to synergistically support international peacekeeping efforts and other nonproliferation initiatives.
- Perform technology assessments and provide technical expertise in areas relevant to the production and detection of biological agents to support DoD and U.S. policy makers and negotiators in determining the impact of proposed Biological Weapons Convention (BWC) alternative methodologies, declaration requirements and transparency measures on DoD equities, and in representing the U.S. during BWC Review Conferences.

B. Accomplishments/Planned Program:

Cost ($ in thousands)	FY 2002	FY 2003	FY 2004	FY 2005
Arms Control Technology	57.8	42.5	3.8	13.2

FY 2002 Accomplishments

- Assessed potential utility of non-visual ballistic missile verification methods and identified follow-on R&D objectives.
- Continued a Space Arms Control Technology Assessment to support DoD analysis and evaluation of potential space arms control measures and the need for verification technology developments.
- Identified the technological impact of potential multilateral strategic verification regimes.
- Executed a warhead monitoring regime demonstration at the Pantex Plant.
- Continued follow-on efforts for the cooperative development of strategic arms control technologies with the Russian Federation.
- Developed applications using ultrasonic interferometry techniques for strategic arms control monitoring.
- Continued Open Skies Management and Planning System (OSMAPS) life-cycle upgrade assessment.
- Assessed various technology options to support the U.S. arms control delegations to NATO, OSCC, the Joint Consultative Group, the Forum for Security Cooperation, the Anti-Personnel Landmine (APL), Small Arms/Light Weapons (SA/LW), Convention on Conventional Weapons (CCW), Open Skies and regional arms control negotiations.
- Developed prototype computer-based training for CFE Treaty inspection/escort training.
- Assessed deployment of unmanned combat air vehicles (UCAV) potential impact on CFE treaty.
- Initiated assessment of confidence and security building measure (CSBMs) applicable to the Korean peninsula.
- Provided RDT&E support for evaluation of upgraded and/or replaced optical cameras, video camera and Infrared Line Scanner (IRLS) and Synthetic Aperture Radar (SAR) for the Open Skies Aircraft.
- Assessed sensor technology for stand off Anti-Personnel landmine (APL) detection and mapping.
- Provided technical assessments for Open Skies, APL, CCW and SA/LW treaties/negotiations.
- Defined User and System software requirements for next generation of Chemical Weapons Convention (CWC)-related analytical equipment.
- Assessed new advances in rapid chemical analytical technologies and evaluated potential applications of new sensors to CWC-related sample analysis. Validated mass spectra, IR spectra, Nuclear Magnetic Resonance (NMR) spectra and Gas Chromatograph (GC) retention indices for inclusion in the Organization for the Prohibition of Chemical Weapons (OPCW) central analytical database.
- Completed testing of a prototype Photoionization Mass Spectrometer.
- Completed brassboard design of low power Gas Chromatograph equipped with Pulsed Flame Photometric detection (GC/PFPD).
- Initiated end-user assessment of Advanced NonDestructive Evaluation equipment suite to evaluate human use factors and effectiveness of training modules.

- Accepted delivery of next-generation Acoustic Contact Evaluation (ACE) hardware, DSA-620, that expands the swept frequency range and incorporates additional detection capabilities.
- Provided technical support to Office of the Secretary of Defense (Policy) (OSD(P)) in preparation for Review Conferences. Assessed impact of CWC and proposed BWC-related activities on DoD equities. Evaluated implications and consequences for DoD of potential changes to the CWC.
- Developed and validated ten (10) new real-time polymerase chain reaction (PCR) assays for BW threat agents.
- Continued development of cost effective computerized, rapidly executing techniques and algorithms to detect, locate, and identify seismic, hydroacoustic, infrasound, and radionuclide signals from operational sensor systems.
- Continued the industry-based development of nuclear detection sensors and analysis technology in compliance with Congressional emphasis.
- Initiated installation and began preliminary operations at the infrasound station at Newport, WA.
- Began installation of the infrasound station at Fairbanks, AK.
- Continued upgrade of data acquisition and satellite communications systems at auxiliary seismic stations.
- Completed field-testing of the first engineering prototype Automated Radioxenon Sampler/Analyzer (ARSA) at the Charlottesville, VA radionuclide station.
- Upgraded three of the Radionuclide Aerosol Sampler/Analyzers (RASA) already on stations.
- Continued development of procedures for sample handling and analysis at the radionuclide laboratory at the Environmental Measurements Laboratory in NY, NY.
- Developed and completed delivery of an upgrade to the Release 3 software for the International Data Center (IDC) in support of Nuclear Event Monitoring.
- Continued development of portable high-resolution room temperature gamma ray detectors.
- Continued development of portable highly efficient neutron detectors.
- Installed one unit of the Automated Radiozenon Sampler/Analyzer (ARSA) in China.
- Continued development of the next generation of treaty support information management capabilities under the Arms Control Information and Notification Program, using state-of-the-art technologies and adhering to DoD international standards.
- Developed and completed delivery of the Open Skies notification module under the Compliance Monitoring and Tracking System (CMTS) in support of notification reporting under the Open Skies Treaty.
- Developed and completed delivery of the Data Management System (DMS) application under the Compliance Monitoring and Tracking System (CMTS) in support of Adaptive Conventional Armed Forces in Europe Treaty (ACFE) reporting obligations in preparation for a CFE Entry-Into-Force (EIF).

FY 2003 Plans

- Provide technical negotiation support for Strategic Offensive reduction Treaty (SORT).
- Develop UAV and/or fixed/rotary wing airborne RADIAC systems that can detect, quantify and provide material identification.
- Develop technology suite to rapidly identify sealed container contents for chemical or high explosives, consisting of four identification components, Acoustic Contact Evaluation (ACE), Neutron Spectroscopy (Mini-PIS), x-ray and real-time Radiography.
- Continue cooperative development of strategic arms control technologies with the Russian Federation and demonstrate a potential warhead monitoring regime.
- Continue development of portable high-resolution room temperature gamma ray detectors.
- Continue development of portable highly efficient neutron detectors.
- Provide technical support (to include quick turn around and longer term analyses) to the U.S. arms control delegations to the NATO, OSCC, the Joint Consultative Group, the Forum for Security Cooperation, and other negotiation and DoD analysis and policy formulation activities.
- Continue Open Skies sensor performance evaluations and accomplish RDT&E to support application of sensor equipment for Open Skies aircraft.
- Continue Open Skies Management and Planning System (OSMAPS) life-cycle upgrade assessment.
- Initiate Data Preparation Facility (DPF) enhancements to meet Open Skies operational requirements.
- Evaluate mass spectrometry technologies for detection of novel chemical agents, biological molecules and organisms.
- Continue development of sample preparation and analytical methods for generating standardized mass spectra for biological threat agents.
- Validate sample preparation methods for alternative sample matrices to include biomedical materials.
- Develop miniaturized & low powered instruments for follow-on technologies for advanced screening and determinative analysis of chemical and biological samples.
- Validate MAGIChip DNA microarray and Electronic Taste Chip immunological sensor for identification of high priority BW agents and toxins.
- Expand Long Path Optical Sensor System (LPOSS) CW sample screening instrumentation and test parameters to compounds other than nerve agents.
- Complete proof-of-concept work using Molecularly Imprinted Polymers (MIPs) for CW sample preparation/clean-up of biomedical & environmental matrices.
- Produce prototype electronic taste chip bead panel at University of Texas/Austin for BW detection as specified under the CT3F program.
- Complete fabrication beta-prototype of the Low Power Gas Chromatograph under CT3F program.
- Deploy and field test Traffic-Light-Sensor™ for rapid nerve agent detection developed under a DTRA ACT Emerging Technology program.
- Expand target analyte capability to include mustard CW and associated precursor/degradation compounds for Long Pathlength Optical Spectrometer System (LPOSS) under CT3F program.

- Accept deliverables under two Phase II SBIR programs to develop a conductive polymer CW detection system for air and water, respectively.
- Incorporate dielectric chemical discrimination as part of the acoustic technologies developed under the DTRA non-destructive evaluation program.
- Complete CW agent testing at ECBC associated with the NIST metal oxide sensor development program.
- Kick-off environmental fate and analysis protocol efforts for emerging threat agents.
- Conduct operational test using mini-PINS NDE equipped with electrical neutron generator.
- Expand acoustic nondestructive evaluation database to include WWI munitions parameters from old & abandoned sites.
- Accept delivery of prototype GC/Metal-Insulator-Metal Ensemble (MIME) chemical sensor from NRL.
- Accept delivery of DTRA/NASA sponsored SBIR Phase II mini-mass spectrometer prototype with expanded mass range.
- Continue research and development to improve understanding of source phenomenology and propagation for nuclear events near detection threshold and enhance detection, location, screening, and identification of underground, oceanic, and atmospheric events through a peer-reviewed program of basic research.
- Continue development of the next generation of treaty support information management capabilities under the Arms Control Information and Notification Program, using state-of-the-art technologies and adhering to DoD international standards.
- Continue development of the next generation conventional treaties application suite to integrate and provide consistency in reporting across conventional treaties and agreements.
- Complete development and deliver the Integrated Notification Application, replacing the Open Skies Notification Front End System (NOFES), Conventional Armed Forces in Europe NOFES and Confidence and Security Building Measures Macros to the Organization for Security and Cooperation in Europe.
- Continue development of the Inspection Planning Module to manage inspector and transport crew personnel information and conduct situational analysis
- Complete development and delivery of the Treaty Limited Equipment search tool under the Compliance Monitoring and Tracking System.
- Conduct independent study and analysis of the DoD CMR future role and mission in a post-CTBT environment
- Continue to support basic research to improve understanding of source phenomenology and signal propagation of nuclear treaty-related events that lower detection thresholds and enhance detection and enhance location and identification of underground, oceanic, and atmospheric events through a competitive peer-reviewed program.
- Development of advanced prototype digital seismic and seismo-acoustic sensor arrays and development of enhanced signal detection and noise suppression methods.
- Development and testing of automated radionuclide gas sensor systems and fielded test deployment in China.
- Continue automated and interactive prototype data center system R&D at the DoD CMR in support of next generation system software for National Technical Means.

- Continue research on location and calibration for seismic events for ground truth.
- Continue research on rapidly executing techniques and algorithms to detect, locate, and identify seismic, acoustic and radionuclide signals from global and regional operational monitoring sensor systems.
- Continue the industry-based development of nuclear detection sensors and analysis technology in compliance with Congressional emphasis.
- Continue research, development and enhancement of operational US Atomic Energy Detection System national technical means nuclear test monitoring and verification system software and hardware.

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- Provide technical support (to include quick turn around and longer term analyses) to the U.S. arms control delegations to the NATO, OSCC, the Joint Consultative Group, the Forum for Security Cooperation, and other negotiation and DoD analysis and Policy formulation activities.
- Assess requirements for a Data Annotation, Recording and Mapping System (DARMS) trainer to support Open Skies operators.
- Initiate development of OSMAPS life-cycle upgrades and conduct required Independent Verification & Validation (IV&V) tests.
- Continue development of the next generation of treaty support information management capabilities under the Arms Control Information and Notification Program, using state-of-the-art technologies and adhering to DoD international standards.
  - Continue development of enhanced web-based training and situational analysis tools under the ACIN program.
  - Complete development and delivery of the Inspection Planning Module.
- Continue IV&V tests of information processing systems.
- Participate in OPCW technical working groups in order to assess changes in equipment and procedures associated with CWC inspections
- Transfer Basic Seismic Research Program to the US Air Force.
- Transfer the International Monitoring Station development and the Center for Monitoring Research to the US Army.

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers:

- Over $10M of FY 2002 funding is planned or has been funded (obligated) with Science Application Inc., at various locations on multiple actions. All work supports the mission of the Arms Control Technology program.

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development – BA3 0603711BR	**PROJECT NAME AND NUMBER:** Project BI - Arms Control Technology

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6	**R-1 ITEM NOMENCLATURE:** Critical Technology Support 0605110BR

Cost ($ in millions)	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	**FY 2007**	**FY 2008**	**FY 2009**
Total 0605110BR Cost	3.2	1.9	1.9	2.0	2.0	2.0	2.0	2.0
Project BB – Small Business Innovative Research (SBIR)	0	.1	.1	.1	.1	.1	.1	.1
Project BL – Militarily Critical Technology Program	3.2	1.8	1.8	1.9	1.9	1.9	1.9	1.9

A. Mission Description and Budget Item Justification:

- The Military Critical Technology 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 USG 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 and treaty compliance inspections;
  - Identification of foreign technologies of interest to the DoD and opportunities for international cooperative research and development;
  - Identification of Homeland Security and terrorism applications of militarily critical technologies.

  Several of the activities performed by the MCTP include:
  - Developing and publishing in both hard copy and electronic form (including Internet version, both restricted and public) various editions of the MCTL 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.

  These projects include funding for travel by DoD personnel in support of the management and technical objectives.

- The Technology Security Assessment System (TSAS) is being designed and developed to provide the analytical tools necessary for policy analysts, case analysts, and technical/intelligence analysts within DTRA to glean trends and relationships from a variety of data resources to assist in policy development and in case review processes.

B. Program Change Summary:

($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget	**3.3**	**1.9**	**1.9**	**2.0**
Current President's Budget	**3.2**	**1.9**	**1.9**	**2.0**
Total Adjustments	**-.117**			
Congressional program reductions	**-.072**			
Congressional rescissions				
Congressional increases				
Reprogrammings	**-.045**			
SBIR/STTR Transfer				

Change Summary Explanation:

- Changes between the previous President's Budget FY 2002 funded column and the current President's Budget FY 2002 column is due to a Congressional reduction of $72K (undistributed/distributed fair share) per Public Law 107-117, SEC 8022 and 8032. Also included is a below threshold reprogramming in support of the Agency's Small Business Innovative Research Program.
- Changes between FY 2002 and FY 2003 reflect decreased funding due to the completion of the application development of the Technology Security Assessment System.

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

D. Acquisition Strategy: N/A

Exhibit R-2a, RDT&E Project Justification	Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6 0605110BR	**PROJECT NAME AND NUMBER:** Project BB – Small Business Innovative Research

Cost ($ in millions)	FY 2002	FY2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BB - Small Business Innovative Research (SBIR)	0	.1	.1	.1	.1	.1	.1	.1

A. Mission Description and Budget Item Justification:

- This project provides the means to:
  - Stimulate technological innovation in the private sector
  - Strengthen the role of small business in meeting DoD research and development needs
  - Foster and encourage participation of minority and disadvantaged businesses in technological innovation
  - Increase 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 2002	FY 2003	FY 2004	FY 2005
Small Business Innovative Research (SBIR)	0	.1	.1	.1

FY 2002 Accomplishments

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

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

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

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers : None

Exhibit R-2a, RDT&E Project Justification		Date: February 2003
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support – BA6	0605110BR	**PROJECT NAME AND NUMBER:** Project BL – Militarily Critical Technologies Program

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project BL – Militarily Critical Technology Program	3.1	1.8	1.8	1.9	1.9	1.9	1.9	1.9

A. Mission Description and Budget Item Justification:

- MCTP provides critical data required to provide:
  - Support to the ongoing update of the Militarily Critical Technologies List (MCTL)
  - 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
  - Support for the National Security Presidential Directive (NSPD)-19 review process
  - Identification of Homeland Defense and terrorism applications of militarily critical technologies

B. Accomplishments/Planned Program:

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Military Critical Technology Program	2.0	1.8	1.8	1.9

FY 2002 Accomplishments

- Developed and published in hard copy and electronic form (including restricted and public Internet sites) the remaining sections of developing critical technologies of the MCTL in data sheet format.
- Conducted senior level review of MCTL documents for releasability. Developed and implemented a restricted MCTL web site hosted by DTIC. Maintained public MCTL web site.
- Monitored and assessed dual use and military technologies worldwide and developed technology assessments.
- Assisted in the development of proposals for negotiations in Wassenaar Arrangement export control regime. Produced record of deliberations.
- Provided technical support for the review/revision of the U.S. Munitions Lists under the Defense Trade Security Initiative #17.

FY 2003 Plans

- Develop and publish in both hard copy and electronic form updates to five sections of Weapons Systems Technologies the MCTL in data sheet format.
- Maintain public and restricted access MCTL web sites.
- Monitor and assess dual use and military technologies worldwide and develop technology assessments to support national security actions.
- Assist in the development of white papers and proposals for negotiations in multilateral export control regime. Provide on-site technical support at the Wassenaar Arrangement negotiations. Produce record of deliberations.
- Provide technical support for the DoD review/revision of the U.S. Munitions Lists Categories IV, VII, IX, X, and XIII under the Defense Trade Security Initiative #17 and Interagency review of Categories VI, XI, XII, XV, and XX.
- Provide analytical support for Congressional reports.
- Provide support for the NSDP-19 review process.
- Identify Homeland Defense applications of militarily critical technologies in MCTL updates.

FY 2004 Plans

- Develop and publish in both hard copy and electronic form updates to 10 sections of Weapons Systems Technologies of the MCTL in data sheet format.
- Maintain public and restricted access MCTL web sites.
- Monitor and assess dual use and military technologies worldwide and develop technology assessments to support national security actions.
- Assist in the development of proposals for negotiations in multilateral export control regime. Provide on-site technical support at the Wassenaar Arrangement negotiations. Produce record of deliberations.
- Provide technical support for the Interagency review/revision of the U.S. Munitions Lists Categories IV, VII, IX, X, and XIII under the Defense Trade Security Initiative #17.
- Provide analytical support for various Congressional reports.
- Identify Homeland Defense applications of militarily critical technologies.

Cost ($ in millions)	FY 2002	FY 2003	FY 2004	FY 2005
Technology Security Assessment System (TSAS)	1.2	0	0	0

FY 2002 Accomplishments

- Provided analytical tools with real-time access through secure infrastructure to glean trends and relationships from a variety of data resources to assist in policy development.

FY 2003 Plans

- None

FY 2004 Plans

- None

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Major Performers:

Military Critical Technology Program (MCTP)

- FY 2002 funding in the amount of $1.757M was provided to the Washington Headquarters Service, who then placed the funding with the Institute of Defense Analyses (IDA), both of which are located in Virginia. The total award was broken out into two parts. The first award was for $1M on March 27, 2002 with the second award of $757K on July 15, 2002. The funding provided support for the Military Critical Technology Program (MCTP). IDA has created a structure of Technology Working Group (TWG) chaired largely by on-call consultants that assess technologies on a worldwide basis.