Exhibit R-2, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** WMD Defense Technologies; 0602717BR

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total 0602717BR Cost	**107.443**	**110.602**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Project BB - Small Business Innovative Research*	0.000	2.509	0.000	0.000	0.000	0.000	0.000	0.000
Project BC - Force Protection & Technology App.	1.119	1.616	0.000	0.000	0.000	0.000	0.000	0.000
Project BG - Nuclear Operations	27.031	22.199	0.000	0.000	0.000	0.000	0.000	0.000
Project BH - System Survivability	79.293	84.278	0.000	0.000	0.000	0.000	0.000	0.000

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

A. Mission Description and Budget Item Justification:

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

Project BC provides assessment and mitigation technologies through mission vulnerability assessments of strategic systems while ensuring that recommendations for improvement are implemented through training, design, and construction to enhance force protection, vulnerability mitigation, and collective protection.

Project BG provides analyses and experimental data to identify risks to the nation’s nuclear weapon systems in peacetime operations; evaluations to identify security weapons systems vulnerabilities in various environments; and support to ensure continued nuclear stockpile sustainability and viability.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** WMD Defense Technologies; 0602717BR

Project BH develops and demonstrates affordable strategies and hardening technologies for U.S. systems and forces; conducts component, subsystem, system and end-to-end performance tests and assessments; and provides support on technical and policy matters that relate to the acquisition of survivable systems and strategic system sustainment.

B. Program Change Summary:

($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget	**108.929**	**105.021**	**108.658**	**113.493**
Current President's Budget	**107.443**	**110.602**	**0.000**	**0.000**
Total Adjustment	**-1.486**	**5.581**	**-108.658**	**-113.493**
Congressional program reductions				
Congressional reductions		**-0.419**		
Congressional increases	**1.000**	**6.000**		
Reprogramming				
Classified Program Transfer				
Other Program Adjustments			**-108.658**	**-113.493**
SBIR/STTR Transfer	**-2.486**			

Change Summary Explanation:

- In FY 2008, the Program Element (PE) structure will change to improve organizational coordination and priorities. As part of this reorganization, the efforts under PE 0602717BR move to a new PE 0602718BR, titled WMD Defeat Technologies. The existing PE-WMD Defense Technologies workload and the associated Projects BB, BC, BG, and BH are realigned into PE 0602718BR and its new set of Projects: RA - Systems Engineering and Innovation, RF - Detection Technology, RG - Advanced Energetics & Counter WMD Weapons, RI - Nuclear Survivability, RL - Nuclear & Radiological Effects, RM - WMD Battle Management, RR - Test Infrastructure, RT - Target Assessment Technologies, RU – Basic Research for WMD Knowledge Gaps.
- Additional funding transfers reflect the maturing of WMD technologies and result in the transition of program efforts to system development or operations. Funding transfers to other Program Elements included as part of this reorganization are:

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** WMD Defense Technologies; 0602717BR

- FY 2008: $80.398M to PE 0603160BR; $1.713M to PE 0302199BR.
- FY 2009: $75.456M to PE 0603160BR; $1.751M to PE 0302199BR.

- The table below shows funding realignments, by Project, from PE 0602717BR to PE 0602718BR, PE 0603160BR and PE 0302199BR in both FY 2008 and FY 2009.

FY 2008 Cost ($ in Millions)							
PE 0602717BR		**PE 0602718BR**			**Transfer to other PEs**		Totals
Project	Cost	RA	RF	RI	0603160BR	0302199BR	
BB	2.521	2.521	0.000	0.000	0.000	0.000	**2.521**
BC	1.713	0.000	0.000	0.000	0.000	1.713	**1.713**
BG	23.962	0.000	0.000	0.000	23.962	0.000	**23.962**
BH	80.462	7.464	9.581	6.981	56.436	0.000	**80.462**
Totals	**108.658**	**9.985**	**9.581**	**6.981**	**80.398**	**1.713**	**108.658**

FY 2009 Cost ($ in Millions)							
PE 0602717BR		**PE 0602718BR**			**Transfer to other PEs**		Totals
Project	Cost	RA	RF	RI	0603160BR	0302199BR	
BB	2.557	2.557	0.000	0.000	0.000	0.000	**2.557**
BC	1.751	0.000	0.000	0.000	0.000	1.751	**1.751**
BG	25.28	0.667	3.041	4.000	17.572	0.000	**25.280**
BH	83.905	7.578	12.649	5.794	57.884	0.000	**83.905**
Totals	**113.493**	**10.802**	**15.690**	**9.794**	**75.456**	**1.751**	**113.493**

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

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**R-1 ITEM NOMENCLATURE:** WMD Defense Technologies; 0602717BR

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Program cost, schedule and performance are measured using a systematic approach with approved programs and methods. The results of these measurements are presented to DTRA management on a regular basis to determine program effectiveness and to provide new direction as needed to ensure the efficient use of resources. Program specific performance metrics are outlined within each project description.

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BB – Small Business Innovative Research

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project BB - Small Business Innovative Research*	0.000	2.509	0.000	0.000	0.000	0.000	0.000	0.000

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

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 R&D needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of DoD supported R&D results. These efforts are responsive to Public Law 106-554.

B. Accomplishments/Planned Program:

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009
Project BB - Small Business Innovative Research*	0.000	2.509	0.000	0.000

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

Performance Metrics:

- Number of phase I awards supporting innovative technology development.
- Number of phase II and III awards leading to technology transition.

FY 2006 Accomplishments:

- See Project BB of PE 0605502BR.

FY 2007 Plans:

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

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BB – Small Business Innovative Research

FY 2008 Plans:

- Not Applicable. See PE 0605502BR.

FY 2009 Plans:

- Not Applicable. See PE 0605502BR.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BC – Force Protection & Technology Applications

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project BC - Force Protection & Technology App.	1.119	1.616	0.000	0.000	0.000	0.000	0.000	0.000

*Funding and activities realigned into PE 0302199BR in FY 2008.

A. Mission Description and Budget Item Justification:

This project develops assessment and mitigation technologies to conduct mission vulnerability assessments of strategic U.S./Allied systems leading to the development of investment strategies for improved survivability. This project also ensures that assessment training programs, engineering designs, and new construction embody sound force protection, vulnerability mitigation, and collective protection principles. Some of the project's products and services include: Balanced Survivability Assessments (BSA); Vulnerability out-briefs and written reports; overall force protection vulnerability trend data; the National and North Atlantic Treaty Organization (NATO) conferences for Underground Facility Managers; and Multi-disciplined technical engineering expertise support.

B. Accomplishments/Planned Program:

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009
Project BC - Force Protection & Technology App.	1.119	1.616	0.000	0.000

*Funding and activities realigned into PE 0302199BR in FY 2008.

Performance Metrics:

- Fidelity of real-time information provided during on-site out-briefs, with a goal of 95%.
- Number of assessments completed, with a target of six per year.
- Timeliness and accuracy of follow-on written reports, with a goal of 90 days or less following completion of assessment.

FY 2006 Accomplishments:

- Conducted six balanced survivability and integrated vulnerability assessments of DoD facilities and systems as tasked by Combatant Commands, the Joint Staff, and Office of the Secretary of Defense. Twelve assessments have been accomplished with high fidelity of information accuracy > (95%) and in a timely manner (< 90 days).

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BC – Force Protection & Technology Applications

FY 2007 Plans:

- Conduct 12 balanced survivability and integrated vulnerability assessments of DoD facilities and systems as tasked by Combatant Commands, the Joint Staff, and Office of the Secretary of Defense. Conduct balanced vulnerability assessment of defense and critical national infrastructure facilities and systems. Conduct architectural analyses to determine systemic vulnerabilities.

FY 2008 Plans:

- Not Applicable. See PE 0302199BR.

FY 2009 Plans:

- Not Applicable. See PE 0302199BR.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BG – Nuclear Operations

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project BG - Nuclear Operations	27.031	22.199	0.000	0.000	0.000	0.000	0.000	0.000

***** Funding and activities realigned into Projects RA, RF and RI of PE 0602718BR and PE 0603160BR in FY 2008.

A. Mission Description and Budget Item Justification:

This project directly supports the National Military Strategy, including the dictates of the Nuclear Posture Review (NPR), and is directed by the Joint Chiefs of Staff (JCS) in the Joint Strategic Capabilities Plan (JSCP) Nuclear Annex. These programs are responsive to the oversight of the Nuclear Weapons Council and provide critical support to Combatant Commands (COCOMs), Services, JCS and Office of the Secretary of Defense.

As tasked by the DoD Nuclear Weapon System Safety Program, the surety programs provide COCOMs, Services and JCS with technical analyses, studies, research, and experimental data necessary to identify and quantify risks of plutonium dispersal and Loss of Assured Safety due to accidents, fires or natural causes during peacetime operations of the nation's nuclear weapon systems.

MIGHTY GUARDIAN Force-on-Force tests aid in satisfying requirements for the Air Force and Navy to provide absolute denial of access to nuclear weapons in all environments, from storage to transit. The results of the evaluations identify security vulnerabilities to weapons systems in various environments. The Air Force and Navy identify projects that require research and development to demonstrate, test, and evaluate systems prior to Service procurement to successfully plan and conduct force-on-force tests and associated engineering studies that accurately evaluate the adequacy of DoD, Service and COCOM nuclear security policies. Through physical security projects in support of COCOMs and Services, new and innovative technologies are developed for the protection of nuclear resources. Following proof-of-concept, these projects are transitioned to the Services for advanced development, procurement, and fielding.

As tasked, continue to operate as the Director of Defense Research and Engineering (DDR&E) Executive Agent for Annual Certification support related stewardship and sustainment activities. Provide support to senior program managers and decision makers concerning issues associated with maintaining and improving the aging stockpile; senior level committees that identify and develop programs to improve the reliability and sustainability of the nuclear stockpile; and an outreach program to educate DoD planners and managers about issues associated with sustaining the nuclear stockpile. In support of national requirements necessary to maintain a viable nuclear deterrent, the Defense Integration and Management of Nuclear Data Services (DIAMONDS) and the Nuclear Management Information System (NUMIS) provides automated tools that enable users to maintain, report, track and highlight trends affecting the nuclear weapon stockpile activities ensuring continued sustainability and viability of the nuclear stockpile.

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BG – Nuclear Operations

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

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009
Project BG - Nuclear Operations	27.031	22.199	0.000	0.000

*Funding and activities realigned into Projects RA, RF and RI of PE 0602718BR and PE 0603160BR in FY 2008.

Performance Metrics:

- Successful completion of Mighty Guardian test, measured by completing all necessary planning and logistics steps, troops arriving when required, training completed, execution of the test, redeployment of forces, and publishing a final report within 90 days of completion.
- Development of a DoD annex to the National Response plan for a pandemic flu and subsequent national-level exercises to test plan.
- Development of DTRA Security Cooperation Plans for all regional Combatant Commands.
- Successful completion of Nuclear Management Information System (NUMIS) integration: measured by officially establishing Defense Integration and Management of Nuclear Data Services (DIAMONDS) as the stockpile database system of record.
- Successful completion of advanced DIAMONDS capabilities: measured by the deployment of an interactive Joint Nuclear Weapons Publication System (JNWPS) module, Decision Support Module, In-transit nuclear weapons tracking module, the Nuclear Inventory Management and Cataloging System, and Computer-Based Training module to all Air Force and Navy nuclear strategic and custodial units.

FY 2006 Accomplishments:

- Executed Mighty Guardian IX at Whiteman Air Force Base, MO to evaluate nuclear security policy as it applies to Weapons Storage Areas.
- Conducted hazard analysis research and development of nuclear weapon fire involving modeling simulations for the Air Force for use in the Integrated Weapons of Mass Destruction Tool Kit and Nuclear Capabilities Services.
- Provided analytical subject matter expert support to White House table top exercise for national response to a pandemic flu.
- Initiated development of DTRA-wide Security Cooperation Planning to support DoD nonproliferation, counterproliferation, and consequence management activities in selected nations within Combatant Commands' Areas of Responsibility as we are initiating Combating WMD R&D collaboration with specified nations.

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BG – Nuclear Operations

- Assisted Supreme Headquarters Allied Powers, Europe (SHAPE) J6 in clarifying the Minimum Military Requirement for survivable, reliable communications to assure command, control and positive control of the nuclear mission and to assure that the International Military Staff understands the importance of the nuclear mission, thereby aiding in quick screening of the requirement by the Military Committee.
- Provided enhanced technical support and analysis to the Nuclear Weapons Council (NWC) and Nuclear Weapons Council Standing and Safety Committee (NWCSSC); supported development of the Nuclear Weapons Stockpile Memorandum and the Requirements and Planning Document and other annual high-level nuclear stockpile reports.
- Provided analysis to develop closure actions by the Nuclear Command and Control Issues Working Group (NC2IWG) to resolve long-standing deficiencies in Nuclear Command and Control Systems and in DoD meeting National Security Presidential Directive (NSPD)-28 requirements.
- Completed requirements collection, application design and development of Navy Defense Integration and Management of Nuclear Data Services (DIAMONDS) functionality.
- Began integration of Nuclear Management Information System (NUMIS) functionality and redesign of reporting system into DIAMONDS.

FY 2007 Plans:

- Conduct Mighty Guardian X Force-On-Force tests at Kirtland Air Force Base, NM.
- Continue hazard analysis research and development of nuclear weapon fire involvement modeling simulations for the Air Force for use in the Integrated Weapons of Mass Destruction Tool Kit (IWMDT) and Nuclear Capabilities Services (NUCS).
- Conduct fire prevention and suppression hardware development, and fact finding for the production of a Uniform Facility Criteria for DoD nuclear weapon capable storage and maintenance buildings.
- Continue to provide enhanced technical and operational support and analysis to NWC and NWCSSC and other high-level committees and senior decision-makers to transform the nuclear stockpile and infrastructure.
- Continue to provide operational and technical support to DoD and National Nuclear Security Administration through the DTRA Stockpile Associate Program and Air Force Institute of Technology sponsorship.
- Complete NUMIS integration, parallel test and establish DIAMONDS as system of record.
- Complete fielding of DIAMONDS at Navy sites by end of 1st quarter, FY 2007.
- Develop and deploy enhanced reporting system in DIAMONDS.
- Begin planning advanced/interactive Joint Nuclear Weapons Publications in DIAMONDS.
- Begin Decision Support Module development for DIAMONDS.

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BG – Nuclear Operations

FY 2008 Plans:

- Not Applicable. See Projects RA, RF and RI of PE 0602718BR and PE 0603160BR.

FY 2009 Plans:

- Not Applicable. See Projects RA, RF and RI of PE 0602718BR and PE 0603160BR.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BH – System Survivability

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project BH - System Survivability	79.293	84.278	0.000	0.000	0.000	0.000	0.000	0.000

* Funding and activities realigned into Projects RA, RF, RI of PE 0602718BR and PE 0603160BR in FY 2008.

A. Mission Description and Budget Item Justification:

This project constitutes the DoD resident science and technology expertise in nuclear and related survivability matters. It develops and demonstrates affordable strategies and hardening technologies for U.S. systems and forces; transfers the technical products to acquisition program offices; conducts component, subsystem, system and end-to-end performance tests and assessments for the Services and Combatant Commands; and provides support to Office of the Secretary of Defense on technical and policy matters that relate to the acquisition of survivable systems and strategic system sustainment. This project encompasses activities in four technology areas: Radiation Hardened Microelectronics, Simulation Technology, Assessment Technology and Radiation Detection Technologies.

The Radiation Hardened Microelectronics area responds to DoD space and missile system requirements for radiation-hardened microelectronics and photonics technology to support mission needs.

The Simulation Technology area provides the test capability to produce a radiation environment similar to that of a nuclear detonation. These nuclear weapon effects simulators are used to validate nuclear survivability requirements for DoD missile and space systems, conduct research in radiation effects, and validate computational models.

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

Detection Technologies develops or exploits radiation sensor, dosimetry and biological technologies and integrates them into real-time, forward-

deployed tools for characterizing radiologically hazardous environments. Its products protect the health and welfare of U.S. service personnel and allied forces by monitoring human survivability during operations on the radiological/WMD battlefield or in areas of suspected WMD development or release.

B. Accomplishments/Planned Program:

Cost ($ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009
Project BH - System Survivability	79.293	84.278	0.000	0.000

*Funding and activities realigned into Projects RA, RF, RI of PE 0602718BR and PE 0603160BR in FY 2008.

Performance Metrics:

- Achieve Radiation Hardened (RH) 150 nanometer (nm) structured- Application Specific Integrated Circuit (ASIC), RH 150nm 16M Static Random Access Memory (SRAM) and Radiation Hardened by Design (RHBD) 90nm reconfigurable Field Programmable Gate Array (r-FPGA).
- Provide DoD the ability to predict the survival and mission impact of military critical systems exposed to nuclear weapon environments within acceptability criteria defined during the model accreditation process.
- Number of radiation detector prototypes completed.

FY 2006 Accomplishments:

- Initiated a focused effort to develop an Electron Paramagnetic Resonance (EPR) tool to measure lifetime radiation exposure from induced changes in tooth enamel non-destructively.
- Completed the second phase development of a radiation biodosimeter to assay individual radiation exposure after a radiological event.
- Initiated efforts to develop a portable mercuric iodide-based gamma-ray sensitive imaging instrument for portable scanning of suspicious containers by troops in the field. This effort was executed under a Congressional Adjustment titled: “Advanced Portable Mercuric Iodine Imaging Technology for Chemical, Biological, Radiological Nuclear and High Explosive Special Operations”.
- Demonstrated RH Electronic Design Automation (EDA) 150nm design capability for digital technology and RH 250nm Read Out Integrated Circuit (ROIC).
- Demonstrated a 100% increase in the generation of X-ray energy per unit area and a 150% improvement in output of compact primary energy storage technology. The improvement in warm X-ray energy gives customers better fidelity over a larger area to more accurately simulate nuclear radiation effects testing for solar cells, structures, cables and electronics. Customers interested in these improvements

include SMC and Sandia National Laboratories. The pulse power accomplishment with the Fast Marx prototype system demonstrates the potential for using this technology in next generation simulators. The Fast Marx approach offers the potential of achieving higher power X-ray systems at a reduced cost per energy unit output.

- Maintained DoD Nuclear Weapons Effects test capability in support of DoD and DOE research and test requirements.

FY 2007 Plans:

- Continue a focused effort to develop an Electron Paramagnetic Resonance (EPR) tool to non-destructively measure lifetime radiation exposure from teeth non-destructively.
- Execute a re-evaluation of biomarkers for expression of radiation exposure in Messenger Ribonucleic Acid (mRNA) and proteins before initiating a field test of the radiation biodosimeter utilizing voluntary human subjects, probably oncology patients, to evaluate the ability of the biodosimeter to accurately measure exposure.
- Demonstrate radiation hardened 150 nanometer (nm) bulk silicon and silicon-on insulator (SOI) technologies in the following integrated circuits: 16M Static Random Access Memory (SRAM), structured Application-Specific Integrated Circuit (ASIC), and 250Kgate Field Programmable Gate Array (FPGA). These devices will support systems that include Transformational Satellite Communications (TSAT), Space-Based Radar (SBR) and other National Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR) space assets.
- Demonstrate innovative radiation hardening methods for 90nm technology, radiation-hardened (RH) Electronic Design Automation (EDA) 150nm design capability for combined digital and analog/mixed-signal (A/M-S) technologies.
- Plan for disposition of DTRA Nuclear Weapons Effects (NWE) simulators to new DoD sponsor or to a fully-reimbursable business model in order to provide a test capability for DoD and Department of Energy (DOE) system developers.

FY 2008 Plans:

- Not Applicable. See Projects RA, RF and RI of PE 0602718BR and PE 0603160BR.

FY 2009 Plans:

- Not Applicable. See Projects RA, RF and RI of PE 0602718BR and PE 0603160BR.

C. Other Program Funding Summary: Not Applicable.

Exhibit R-2a, RDT&E Budget Item Justification	Date: February 2007
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	**PROJECT NAME AND NUMBER:** 0602717BR Project BH – System Survivability

D. Acquisition Strategy: Not Applicable.

E. Major Performers: Not Applicable.