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.

FY 2004 Plans .

- 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