

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602000D8Z - Joint Munitions Technology						
Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total Program Element (PE) Cost	4.905	11.133	15.542	15.283	15.517	15.401	15.603	15.823
P000 Inensitive Munitions	4.905	11.133	15.542	15.283	15.517	15.401	15.603	15.823

A. Mission Description and Budget Item Justification: (U) This program addresses applied research associated with improving the lethality, reliability, safety and survivability of munitions and weapon systems. The goal is to develop joint enabling technologies that can be used by the Services as they develop their specific weapon programs. The program invests in technologies from a Joint Service perspective thus insuring the development of technology with the broadest applicability.

<u>B. Program Change Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	6.078	10.447	10.864	10.571
Current BES/President's Budget (FY 2008/2009)	4.905	11.133	15.542	15.283
Total Adjustments	-1.173	0.686	4.678	4.712
Congressional Program Reductions		-0.064		
Congressional Rescissions				
Congressional Increases		0.750		
Reprogrammings	-1.000			
SBIR/STTR Transfer	-0.173			
Other			4.678	4.712

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Not Applicable.

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PE NUMBER AND TITLE
0602000D8Z - Insensitive Munitions

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P000

Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
P000 Insensitive Munitions	4.905	11.133	15.542	15.283	15.517	15.401	15.603	15.823

A. Mission Description and Project Justification: (U) This RDT&E effort is aimed at developing the enabling technologies needed to build weapons in compliance with Insensitive Munitions (IM) requirements established in statute (Title 10, United States Code) and regulation (DoDI 5000.1 and CJCSI 3170.01C). Using technology available today, the Department has incrementally improved the IM response of our current munitions. New munitions which have fully implemented current IM technology and design practices have been able to achieve IM compliance. However, these have been the most easily solved problems. Without new technology, future variants of current weapon systems will have the same, or worse, response to IM stimuli (i.e., they will not improve with the technology available today). New weapon developments will face similar challenges.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Insensitive Munitions (IM)	4.905	11.133	15.542	15.283

FY 2006 Accomplishments: (U) During FY06, the focus of this program has been on five munition areas: High Performance Rocket Propulsion, Minimum Smoke Rocket Propulsion, Blast and Fragmentation Warheads, Anti-Armor Warheads, and High Performance Gun Propulsion. Specific projects addressing these areas are: (1) Insensitive Munitions (IM) Compliant High Performance Rocket Propulsion for Joint Service Applications - This multi-task project was examining novel ingredients and formulations to reduce the response of a high performance rocket propellant to unplanned stimuli. Tasks were exploring different technologies such as low ignition point binders, self-extinguishing propellants, and activated boron; (2) Developed and evaluated of insensitive Ammonium Perchlorate (AP) as a propellant/explosive ingredient - This project is developing and evaluating methods of improving the thermal response of AP through the use of additives to eliminate or suppress the partial decomposition of AP; (3) IM Minimum Smoke Propellants for Joint Service IM Applications - This project explored novel high energy oxidizers, high nitrogen ingredients, and binders for use in propellant formulations. Candidate formulations exhibiting promising mechanical, combustion, thermal and IM performance will be scaled-up and tested in generic rocket motor hardware; (4) Improved Ionic Liquids for IM Development - This project is currently still evaluating certain ionic liquids as a potential TNT replacement. Promising ionic liquids will be tailored and scaled up with the goal of improving their sensitivity and performance properties; (5) Advanced IM Compliant Plastic Bonded Explosives - This project has evaluated reduced sensitivity energetic ingredients in castable Plastic Bond Explosive (PBX) formulations using modern binder systems which promote IM properties with the goal of minimizing the shock and impact sensitivity of these new formulations while maintaining their reduced sensitivity to thermal stimuli.

FY 2007 Plan: (U) In FY07, the program will remain focused on five munition areas: High Performance Rocket Propulsion, Minimum Smoke Rocket Propulsion, Blast and Fragmentation Warheads, Anti-Armor Warheads, and High Performance Gun Propulsion. New projects in FY07 will focus on (1) extending and validating modeling and simulation tools used for the design of managed energy systems, (2) experimentally assessing promising materials, and (3) evaluating new and novel methodologies for venting rocket motor and warhead cases with the goal of preventing catastrophic energy release. In addition to new projects, on-going projects and their major tasks for this year are: (1) IM Compliant High Performance Rocket Propulsion for Joint Service Applications - Complete initial scale-up and characterization of a high-performance solid rocket propellant; (2) Development and Evaluation of Insensitive Ammonium Perchlorate (AP) as a Propellant/ Explosive Ingredient - Evaluate effects of different binders on coated AP. Assess coated AP's combustion properties and down select suppressant candidates for scale-up into a propellant formulation; (3) IM Minimum Smoke Propellants for Joint Service IM Applications - Finalize Minimum Smoke formulations and continue characterization of their mechanical, burn rate and IM properties; (4) Improved Ionic Liquids for IM Development - Produce Ionic liquid candidate at 1

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kg scale and evaluate thermochemical and physical properties of the selected formulation; (5) Advanced IM Compliant Plastic Bonded Explosives - Complete the evaluation of emerging insensitive energetic ingredients. Complete small-scale sensitivity tests on castable PBX formulation; (6) Metal-Accelerating Insensitive Pressed Explosives - Complete formulation optimization on a pressed composition and perform generic IM tests.; (7) Development of Melt Castable Nitrate Salt/Nitramine Explosives - Complete the characterization of the selected Nitrate Salt/Nitramine eutectic formulation.

FY 2008 Plans: (U) Efforts will continue on high performance rocket propellants, minimum smoke rocket propellants, blast and fragmentation explosives, anti-armor explosives and gun propulsion. Promising technologies at Technical Readiness Level (TRL) 5/6 will be transitioned to 6.3/6.4 programs or into weapon development programs. Experimental data from promising new insensitive ingredients, binders, liners and case technologies will be used to extend and validate modeling and simulation tools used for the design of weapon systems. Novel energetic materials and ingredients will be evaluated in formulations and small scale IM hardware.

FY 2009 Plan: On-going projects are: (1) Insensitive Munitions (IM) Compliant High Performance Rocket Propulsion for Joint Service Applications - Scale-up baseline high-performance rocket propellant formulation and screen best propellant/case combinations; (2) Development and Evaluation of Insensitive Ammonium Perchlorate (AP) as a Propellant/ Explosive Ingredient - Evaluate IM response of formulation utilizing suppressed AP; (3) IM Minimum Smoke Propellants for Joint Service IM Applications - Complete minimum smoke formulation development and characterization. Conduct static motor firing to assess the performance promising formulations; (4) Improved Ionic Liquids for IM Development - Begin work on second-generation ionic liquid candidates; (5) Advanced IM Compliant Plastic Bonded Explosives - Demonstrate the detonation and blast performance of a castable PBX explosive formulation. Begin work on PBX using emerging ingredients; (6) Metal-Accelerating Insensitive Pressed Explosives - Manufacture and test several explosively formed projectile charges to assess the performance of insensitive pressable explosives; (7) Development of Melt Castable Nitrate Salt/Nitramine Explosives - Complete formulation of a insensitive Nitrate salt/Nitramine metal accelerating explosive; (8) Development of IM Melt Castable Explosives - Scale up and manufacture an IM melt-castable explosive and evaluate its casting properties; (9) Reactive Liner Evaluation Study - Complete sub-scale testing of reactive liner and accelerated aging study and model the performance of a full-scale test utilizing reactive liner technology; (10) Coating Technologies for IM - Complete final report on intumescent coating testing and conduct packaging demonstration test. Begin work on a coating system for use on missile systems; (11) Thermal Energy Absorbing Binder Systems for Plastic Bonded Explosives - Complete fast cook-off testing and shock sensitivity testing of thermal energy absorbing binder systems; (12) Tailorable Aggregate Insensitive Nitramine Energetic Materials - Characterize performance and sensitivity of propellant and explosive formulations utilizing aggregate insensitive nitramine; (13) Insensitive Large Caliber Gun Propellants - Complete performance, mechanical property and chemical characterization and measurements on selected formulation. Optimize formulation as needed and generate new burn rate measurements.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602227D8Z - Medical Free Electron Laser						
Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total Program Element (PE) Cost	19.558	15.813	0.000	0.000	0.000	0.000	0.000	0.000
P483 Medical Free Electron Laser	19.558	15.813	0.000	0.000	0.000	0.000	0.000	0.000

A. Mission Description and Budget Item Justification: (U) The Medical Free Electron Laser (MFEL) was terminated starting in FY 2008.

B. Program Change Summary	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	19.725	10.255	10.567	10.334
Current BES/President's Budget (FY 2008/2009)	19.558	15.813	0.000	0.000
Total Adjustments	-0.167	5.558	-10.567	-10.334
Congressional Program Reductions		-0.092		
Congressional Rescissions				
Congressional Increases		5.650		
Reprogrammings	0.383			
SBIR/STTR Transfer	-0.550			
Other			-10.567	-10.334

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Not Applicable.

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Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
P483 Medical Free Electron Laser	19.558	15.813	0.000	0.000	0.000	0.000	0.000	0.000

A. Mission Description and Project Justification: (U) The Medical Free Electron Laser program was terminated starting in FY 2008.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Medical Free Electron Laser	19.558	15.813	0.000	0.000

FY 2006 Accomplishments: Thus far, more than 30 clinical procedures have been developed in several medical specialties, including ophthalmology, orthopedics, thermal and chemical burn treatment, and neurosurgery. Work in these areas will continue under the current three-year center grants, with the primary focus of the work remaining on the development of militarily relevant laser medicine applications.

Optical Coherence Tomography (OCT) applications have been developed for examining the structure of joint cartilage and are now being used for early diagnosis of degenerative disease and monitoring of surgical repair of orthopedic injuries. Endoscopic imaging using hand-held OCT probes has been shown to be capable of detecting minor changes in the epithelial cells of gastrointestinal, and respiratory tracts, and such devices have been used to obtain optical biopsies for early assessment of injuries to the trachea and respiratory tract due to smoke and other agents. Work on improving the resolution and speed of OCT imaging continues to be a significant thrust with axial resolutions of 3 um obtained. An ophthalmic OCT imaging system is in regular clinical use to monitor retinal morphology and pathologic changes. A greater than 100-fold increase in OCT imaging speed provides new opportunities to detect subtle changes in various tissues to improve the management of a range of injuries and to use OCT for a broad area of diagnostic purposes. Other technologies include Diffuse Optical Spectroscopy techniques that potentially can be used to non-invasively determine changes in hemodynamic parameters such as oxy/deoxy-hemoglobin ratios and tissue perfusion. Recent work has demonstrated the application of these techniques to the study of cortical depression and tissue perfusion in brain following blast and penetrating head injury. Optical diagnostic methods based on Raman scattering and terahertz spectroscopy continue to be studied to detect and rapidly characterize important biomolecules of interest. Analysis of tissue associated with Parkinson's disease has indicated a possible marker for quantitative measurement of disease progression. Optical methods using passive infrared imagers are also being used to recognize and evaluate clinical conditions, such as collapsed lung and hemorrhagic shock, in a forward casualty care setting.

A wide range of our studies have examined the interactions of laser energy with tissues, cells and biological macromolecules. Models for laser ablation have been developed and used to examine the course of the post-ablation healing process. Studies using the unique single micropulse capability of the Stanford continue, and are providing valuable information on the role of wavelength, pulse structure and pulse sequence in the ablation process on the molecular level. These studies have also demonstrated the nature and extent of collateral damage due to short term temperature effects, and improved healing of laser surgical methods compared to conventional bone cutting in cranial surgery. Work has recently begun on the use of osteogenic liposomes, which have been shown to induce new bone formation at sites of injury. The use of laser energy to draw the liposomes to the injury site and precisely trigger the osteogenic activity is being examined. Effective closure of various wounds and blood vessels has been accomplished using photochemical tissue bonding techniques.

A major upgrade in the components of the Duke University Free Electron Laser (FEL) system has been completed. It operates the first distributed optical klystron FEL, obtaining the highest FEL gain for a storage-ring based FEL and realized controlled switching of polarization by a nonoptical technique. The Duke FEL is unique in its capabilities at ultraviolet wavelengths. More than 5,000 hours of beam time was provided for the use of various scientists at the three FEL facilities combined.

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FY 2007 Plan: Plans for 2007 include continuing work on improving the contrast and depth of Optical Coherence Tomography (OCT) imaging with emphasis on its use in burn and respiratory tract injury, further development of new ultrasmall fiber optic endoscopy systems, new applications of Near Field Optical Microscopy, and other microscopy techniques. Continuing studies in neurological, reconstructive, and ophthalmic surgery applications of lasers, as well as continuing work on optimal laser parameters for dermal and hard tissue cutting and subsequent healing. Development of small, commercially feasible lasers with such optimal parameters will also be sought. Studies will continue on photochemical bonding of tissue, developing new photosensitizers and methods for their delivery, mechanisms for controlling various cellular activities, development of small, battery powered laser nerve stimulation package for forward clinical use, and the use of photodynamic therapy in treating infections of selected microorganisms. Studies on laser ablation and the subsequent healing processes will continue with a continuing focus on determining tissue viability at the wound site, as this is critical for effective wound management. Work on the application of laser-controlled osteogenic liposomes to accelerate musculoskeletal repair will also be a significant focus, and effective wound closure using photochemical tissue bonding will begin clinical trials. In addition, basic efforts are carried out using laser-based spectroscopy methods on the structure and nature of biologically important macromolecules such as proteins; on the dynamics of various surface-based processes; and on the nature, formation and deposition processes of complex thin films. Continued work on spectroscopic methods, surface-based processes, and the nature and formation of thin films are also planned for 2007. Continued efforts to improve performance and reliability at each of the sites, and to supply increased beam time for use by investigators in all of the disciplines noted above. Continuing effort, includes the development of new materials for waveguides through which the laser energy may be routed as well as refinements in the existing laser systems.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
Labs				
	US Army Institute for Surgical Research	San Antonio, TX	Collaboration with university based centers on understanding military needs, on use of specialized animal models and human study facilities, and on arranging clinical studies and technology transfer. Collaboration areas include testing of program developed optical techniques for diagnosing and monitoring blood loss and oxygen carrying capability, brain injury, windpipe damage, burn diagnostics, and wound treatment.	01 MAR 2006
	Naval Medical Research Center	Bethesda, MD	Collaboration with university based centers on understanding military needs, on animal models and human studies, and on arranging clinical studies and technology transfer. Collaboration areas include infrared imaging for field deployable devices for multiple combat casualty care	01 AUG 2005

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injury assessments by first responders.

Universities

	Massachusetts General Hospital	Boston, MA	Photodynamic therapy applied to wound disinfection and infectious disease (e.g., Leishmaniasis), photochemical bonding for nerve, blood vessel and other tissue repair, and advances and diagnostic applications of optical coherence tomography (OCT), endoscopic confocal microscopy, and various nonlinear optical techniques.	01 FEB 2004
	University of California	Irvine, CA	Diffuse optical spectroscopy applied to hemodynamics and brain trauma diagnostics and monitoring, OCT applied to windpipe damage assessment from smoke or chemical insult, burn diagnostics, and surgery for orthopedic and facial injuries. Many studies performed in collaboration with Army Institute for Surgical Research.	15 FEB 2004
	Vanderbilt University	Nashville, TN	Laboratory and clinical studies of wavelength and pulse duration effects of efficiency and collateral damage in laser surgery, diagnostic and therapeutic studies of MFELP breakthroughs in optical nerve stimulation, in technique for analyzing macromolecules as markers for health and disease, and in narrow spectral width x-rays.	01 FEB 2004
	Stanford University	Stanford, CA	Development of luminous human, animal and bacterial cells, development and clinical application of laser and other surgical instrumentation, including breakthrough pulsed electron avalanche knife, studies of wound healing using novel luminescent cells and delivery of wound healing factors techniques, and collaboration with Vanderbilt and Duke on pulsed laser surgery studies.	01 FEB 2004
	Duke University	Durham, NC	Studies of portable infrared imaging devices for medics and forward deployed surgical teams to quickly diagnose injury (e.g. pneumothorax, hemothorax, and compartment syndrome), studies of mechanisms and laser therapy for trauma induced brain seizures, development of small infrared lasers replicating the wavelength and pulse properties for surgical procedures, and operation of facilities based on the unique ultraviolet output of a storage ring free electron laser.	01 FEB 2004

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APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602228D8Z - Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)						
Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total Program Element (PE) Cost	16.824	18.964	15.150	15.185	15.573	15.861	16.070	16.296
P489 Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)	16.824	18.964	15.150	15.185	15.573	15.861	16.070	16.296

A. Mission Description and Budget Item Justification: A. Mission Description and Budget Item Justification: The Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) program provides support for research, collaborative research, (with DoD laboratories and facilities personnel), education assistance, instrumentation purchases, and technical assistance.

- Research. The research grants are to further the knowledge in the basic scientific disciplines through theoretical and empirical activities. Collaborative research allows university professors to work directly with military laboratories or other universities.
- Education. Education assistance funds are used by the selected institutions to strengthen their academic programs in science, mathematics, and engineering thereby increasing the number of under-represented minorities obtaining undergraduate and graduate degrees in these fields. These grants provide equipment, scholarships, cooperative work/study opportunities, visiting faculty programs, summer programs, and a variety of other enhancements designed to support students and to encourage them to pursue careers in science, mathematics, and engineering.
- Infrastructure. This program allows the university to purchase a wide range of laboratory equipment from basic apparatus for education program enhancements to highly sophisticated research instruments, such as lasers and spectrometers.
- Technical assistance. The funds provided assist the HBCU/MI community in areas such as technical proposal writing and effective, accountable administration of grants and contracts.

<u>B. Program Change Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	17.603	14.423	15.613	15.610
Current BES/President's Budget (FY 2008/2009)	16.824	18.964	15.150	15.185
Total Adjustments	-0.779	4.541	-0.463	-0.425
Congressional Program Reductions		-0.109		
Congressional Rescissions				
Congressional Increases		4.650		
Reprogrammings	-0.278			
SBIR/STTR Transfer	-0.501			

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APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602228D8Z - Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)			
Other			-0.463	-0.425	

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Not Applicable.

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APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602228D8Z - Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)						PROJECT P489	
Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	
P489 Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)	16.824	18.964	15.150	15.185	15.573	15.861	16.070	16.296	

A. Mission Description and Project Justification: (U) Mission Description and Project Justification: (U) The Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) program provides support for research, collaborative research, (with DoD laboratories and facilities personnel), education assistance, instrumentation purchases, and technical assistance.

- Research. The research grants are to further the knowledge in the basic scientific disciplines through theoretical and empirical activities.
- Education. Education assistance funds are used by the selected institutions to strengthen their academic programs in science, mathematics, and engineering thereby increasing the number of under-represented minorities obtaining undergraduate and graduate degrees in these fields.
- Infrastructure. This program allows the university to purchase a wide range of laboratory equipment from basic apparatus for education program enhancements to highly sophisticated research instruments, such as lasers and spectrometers.
- Technical assistance. The funds provided assist the HBCU/MI community in areas such as technical proposal writing and effective, accountable administration of grants and contracts.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)	16.824	18.964	15.150	15.185

FFY 2006 Accomplishments: Continue evaluation and funding of research awards made with prior year funds. The FY 2006 DoD Appropriations Act added \$4.000 million for (1) John H. Hopps Defense Research Program \$1.700 million; (Morehouse College, 830 Westview Drive, S.W., Atlanta, GA 30314; (2) Nanoscience and Biotechnology Laboratory Research \$1.000 million (Tennessee State University, 3500 John A. Merritt Blvd, Nashville, TN); (3) Tribal Colleges and Universities \$1.200 million (See awardees below); and (4) Thurgood Marshall Scholarship Fund \$100 thousand (Thurgood Marshall College Fund, 80 Maiden Lane, Suite 2204, New York, NY 10038).

The FY 2006 solicitation closed on January 27, 2006. The program will award 32 grants totaling \$9.5 million to minority institutions. The program received 155 eligible proposals. These included 93 proposals for research and 62 for equipment. The solicitation afforded the HBCU/MI community an opportunity to acquire 21 research grants and 11 equipment grants to enhance science, mathematics, and engineering programs in areas important to the DoD. The research grants will be supported for three years ranging from \$211,000 to \$500,000 (total each). The equipment grants are for a twelve-month

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performance period and will range from \$95,000 to \$200,000. The Army Research Office and the Air Force Office of Scientific Research will execute the awards. The FY 2006 Tribal Colleges and Universities (TCUs) Broad Agency Announcement closed on June 29, 2006. The TCUs program will award 10 grants totaling \$1.7 million. The TCUs program received equipment 19 eligible equipment proposals. The equipment grants are for a twelve-month performance period and will range from \$100,000 to \$225,000. The Army Research Office will make the awards. The announcement of the FY06 TCUs winners was published on August 29, 2006 by the OSD Public Affairs Office via a news release as follows:

TCUs AWARD RECIPIENTS:

Institution - City - ST - ZIP Code

1. Chief Dull Knife College - Lame Deer - MT - 59043
2. College of Menominee Nation - Keshena - WI - 54135
3. Crownpoint Institute of Technology - Crownpoint - NM - 87313
4. Fort Belknap College - Harlem - MT - 59526
5. Fort Berthold Community College - New Town - ND - 58763
6. Little Big Horn College - Crow Agency - MT - 59022
7. Sinte Gleska University - Mission - SD - 57555
8. Stone Child College - Box Elder - MT - 58521
9. Tohono O'odham Community College - Sells - AZ - 85634
10. United Tribes Technical College - Bismark - ND - 58504

s.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
<u>Labs</u>				
	Army Research Office	Research Triangle Park, NC	Makes new awards for the HBCU/MI Infrastructure Support Program competition, and for competition for Tribal Colleges and Universities.	18 APR 2005
	Air Force Office of Scientific Research	Arlington, VA	Fund HBCU/MI Program.	01 OCT 2005

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Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602234D8Z - Lincoln Laboratory Research Program						
Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total Program Element (PE) Cost	29.762	28.810	29.524	31.401	32.258	31.310	31.722	32.168
P534 Lincoln Laboratory	26.762	25.810	26.613	28.483	29.313	28.384	28.757	29.162
P535 Technical Intelligence	3.000	3.000	2.911	2.918	2.945	2.926	2.965	3.006

A. Mission Description and Budget Item Justification: (U) The Lincoln Laboratory research line program (LL Program) is an advanced technology research and development effort conducted through a cost reimbursable contract with the Massachusetts Institute of Technology (MIT). The LL Program funds innovations directly lead to the development of new system concepts, new technologies, and new components and materials. The LL Program contributed foundation technologies to two systems which received the 2002 Packard Excellence in Acquisition Award: (1) the Bio-aerosol sensing and micro-laser technologies were transferred to industry and are in production for the Joint Biological Defense Sensor (JBPDS), and (2) the Free-space optical communications technologies were used in the GeoLite optical communications satellite demonstration system. The LL Program currently has impact in five core technology thrusts: Persistent Surveillance, Sensor Networking and Decision Support, Fiber Lasers and Directed Energy, Advanced Electronics Technology, and Bio-Chem Defense, with emphasis on detection and identification technology, systems analysis and integration. These innovations are intended to negate the effectiveness of enemy biological and chemical weapons, and include efforts in threat assessment, agent detection, and integrated protection. Specific focus areas include potential threats, including those resulting from the rapidly advancing field of genetic engineering as well as worrisome chemical agents. Emphasis is on the practical integration of chemical and biological defenses in an affordable, large-area protection context, not just as one-of-a-kind solutions.

(U) Supporting these five core technology thrusts is a new work effort titled Technical Intelligence. Technical Intelligence will support detailed understanding of technology advancement in important scientific area and other scientific disciplines such as nanotechnology, directed energy and propulsion. Some details are classified, but one effort, called Global Dialogue on Emerging Science and Technology will be jointly sponsored by DOD, Department of State, and CIA will give very detailed insight in such topics as Software Engineering in India, Nanotechnology in South East Asia, European Laser development, for example. This information will in turn assist in development of U.S. capabilities.

B. Program Change Summary	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	29.438	28.975	30.425	32.281
Current BES/President's Budget (FY 2008/2009)	29.762	28.810	29.524	31.401
Total Adjustments	0.324	-0.165	-0.901	-0.880
Congressional Program Reductions		-0.165		
Congressional Rescissions				
Congressional Increases				
Reprogrammings	1.145			

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APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602234D8Z - Lincoln Laboratory Research Program		
SBIR/STTR Transfer	-0.821			
Other			-0.901	-0.880

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Not Applicable.

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APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602234D8Z - Lincoln Laboratory Research Program						PROJECT P534	
Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	
P534 Lincoln Laboratory	26.762	25.810	26.613	28.483	29.313	28.384	28.757	29.162	

A. Mission Description and Project Justification: (U) The Lincoln Laboratory program (LL Program) is an advanced technology research and development effort conducted through a cost reimbursable contract with the Massachusetts Institute of Technology (MIT). The LL Program funds advanced research activities that directly lead to the development of new system concepts, new technologies, and new components and materials, with impact in five core technology thrusts:

(U) Persistent Surveillance, with emphasis on revolutionary sensing techniques, algorithms for detecting and recognizing battlefield targets both in the clear and hidden, and high-performance computing to enable rapid prosecution of suspected targets.

(U) Sensor Networks and Decision Support, with an emphasis on developing and integrated a set of advanced technologies to improve the use of sensing to support military decision making.

(U) Fiber Lasers and Directed Energy, including the development of novel lasers and advanced beam-control techniques. The laser efforts focus on developing advanced, more efficient fiber lasers and on combining multiple fiber lasers to allow scaling to high-energy-laser (HEL) power levels

(U) Advanced Electronics Technology, with emphasis on development of materials, devices, and subsystems utilizing microelectronic, photonic, biological, and chemical technologies to enable new system approaches to DoD sensors.

(U) Bio-Chem Defense, including technology, analysis and systems aimed at defeating enemy use of biological and chemical weapons, and includes efforts in agent detection, diagnosis and treatment, and informatics systems.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Lincoln Laboratory	26.762	25.810	26.613	28.483

FY 2006 Accomplishments:

(U) Radar Technology: Conducted innovative foliage-penetration experiments using the Lincoln Laboratory airborne radar testbed.

(U) Passive Optical Surveillance: Designed a novel read-out array for large-scale infrared focal planes. This read-out will provide direct digital output at each pixel. Began fabrication of the read-out array.

(U) Advanced Ladar: Demonstrated first phase of ultra-high-resolution ladar in the laboratory at modest range. Demonstrated THz detection using detection concept developed in FY 2005. Initiated effort in quantum ladar.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2007

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(U) Advanced Processing: Developed and tested a single-die, integrated radar receiver on a chip. Began development of a digital beamformer. Initiated an effort to develop advanced software tools to take advantage of modern trends in computer hardware, such as tiled processors and novel storage devices.

(U) Multi-Sensor Measurements: Conducted measurements from an airborne platform using a combination of 3D ladar and passive video.

(U) Efforts were conducted in 3 related areas: 1) dynamic command and control (C2) for networked intelligence, surveillance, and reconnaissance (ISR), 2) structured knowledge spaces, and 3) distributed service architecture. In dynamic C2 for networked ISR, completed the cuing experiments begun in FY 2005 and developed scheduling algorithms to allocate sensor collections based on predefined priorities. In structured knowledge spaces, developed software to create a linked map of relationships between raw ISR data, extracted information, and derived knowledge. In distributed service architecture, began to develop a discovery architecture that provides reliable access to ISR data anywhere, even over low-bandwidth, intermittent communications networks.

(U) Advanced Biological and Chemical Agent Threat Assessment: Shifting emphasis to the evolving threat, including the broad class of chemical and toxin Novel Threat Agents, combined with the prospects for modern microbiology. Enabled prioritization and categorization of advanced threats for resource allocation, including countermeasures to current systems.

(U) Biological Agent Sensing: Focused on techniques for preservation and storage of CANARY (Bio-technical program) B-cells for up to six months, which appears achievable with techniques under investigation. Tested automated CANARY in field conditions, establishing Receiver Operating Characteristics (ROCs). Developed mote sensor network for integration of low-cost just-capable sensors.

(U) Chemical Agent Sensing: Exercised chemical sensor testbed for quantitative assessment of sensor approaches, establishing ROC performance metrics. Developed a novel, low-cost early-warning chemical agent sensor that could be used in perimeter defense, based on an inexpensive spectrometer designed to examine the transmitted infrared spectrum from a cooperative thermal source. Completed on-base testing of custom infrared spectrometer for rapid standoff detection of chemical agent plumes over large ranges.

(U) Integrated Solutions: Completed first phase of the HaLT (Hanscom-Lincoln Testbed), a site where advanced sensors, response strategies, filtration, neutralization, and command and control concepts are tested in a realistic setting. Deployed biological and chemical sensors in a portion of laboratory building space, and effected passive and active protection measures to reduce agent exposure. Monitor and track meteorological conditions as well as particulate and chemical vapors, networking the sensors through the command post for both operational evaluation and algorithm development. Developed strategies for decision support system, to aid in real-time course-of-action guidance, for the HaLT and for generic DoD system approaches.

FY 2007 Plan:

(U) Using simulated Intelligence Surveillance Reconnaissance (ISR) data from a computer-generated tactical scene, will conduct an integrated lab decision-support demonstration of the technologies developed in FY 2006. Based on the results of this integrated demonstration, will continue and expand developments in dynamic C2 for networked ISR, structured knowledge spaces, and distributed service architecture.

(U) Continued working to develop tagging and tracking technologies for counter-terrorism applications. Continued field experiments to characterize signatures of facilities handling explosives and fabricating IEDs or other explosive devices. Continued development of improved photon-counting arrays and related readout circuits, with emphasis on enabling passive imaging ISR applications. Developed four-side-abutable tiling techniques needed to support very large focal plane arrays for ISR applications. Developed improved process modules for Closed Circuit Display (CCD) imager and rad-hard CMOS imager processes which support unique focal planes being developed for various DoD ISR systems. Continued development of lithographically defined quantum-dot artificial materials for optoelectronic applications. Developed technologies for highly integrated RF front ends, with emphasis on film bulk acoustic resonators and SOI CMOS RF transistors. Investigated potential of cryogenic operation of silicon-on-insulator CMOS for both analog processing and high performance computing applications. Continued development of superconducting technology for application to quantum computation. Developed Si-based modulators and detectors for use in integrated silicon microphotonic systems, for photonic signal processing applications. Developed high-power photodetectors for use in low-noise RF sources, arbitrary waveform generation, and photonically fed transmitters. Demonstrated large-mode-volume, high-power semiconductor lasers for use in active sensing, countermeasures, or UV sources for bio-agent sensors.

FY 2008 Plan:

(U) Passive Optical Surveillance: Complete fabrication of the read-out array and demonstrate the read-out in the laboratory.

(U) Advanced Ladar: Significantly improve the resolution of the ultra-high-resolution ladar to enable phase two measurements in the laboratory. Begin developing multi-element Tetra Hertz (THz) detectors. Demonstrate THz ladar system in laboratory. Begin ladar experiments using quantum-measurement techniques.

(U) Advanced Processing: Refine radar receiver on a chip and complete digital beamformer. Continue advanced software effort by implementing hierarchical storage on tiled processor and demonstrating prototype application kernels.

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(U) Multi-Sensor Measurements: Add additional ladar modalities to optical aircraft system. Conduct coordinated measurements involving radar systems on one aircraft and passive optical and ladar measurements on another aircraft.

(U) Fiber Laser Technology: Demonstrated single-mode propagation in large-diameter microstructure fiber. Demonstrated multi-Watt, diffraction-limited short-pulse fiber lasers for 3D ladar. Extended short-pulse fiber lasers for 3D ladar to eye safe wavelengths appropriate for tactical systems. Developed 1,000-element, electrically addressable VCSEL array.

(U) Beam-Control Technology: Investigated techniques for turbulence compensation using arrays of phased fibers. Developed and tested prototype of novel wavefront sensor. Focused propagation analysis on mitigation of turbulence effects on 3D ladar images.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
<u>Labs</u>				
	Headquarters Electronic Systems Center	Hanscom AFB, MA	Funds are provided to LL to support the following five core technology thrust areas:1) Persistent Surveillance2) Sensor Networking and Decision Support3) Fiber Lasers and Directed Energy4) Advanced Electronics Technology5) Bio-Chem Defense	16 NOV 2004
	Headquarters Electronic Systems Center	Hanscom AFB, MA	Funds are provided to LL to support the following five core technology thrust areas:1) Persistent Surveillance2) Sensor Networking and Decision Support3) Fiber Lasers and Directed Energy4) Advanced Electronics Technology5) Bio-Chem Defense	16 NOV 2004

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)	Date: February 2007
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APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2	PE NUMBER AND TITLE 0602234D8Z - Lincoln Laboratory Research Program						PROJECT P535	
Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
P535 Technical Intelligence	3.000	3.000	2.911	2.918	2.945	2.926	2.965	3.006

A. Mission Description and Project Justification: Technical Intelligence supports five core technology thrusts in a new work effort titled. Technical Intelligence combines efforts in two areas: 1) from the university community through the JASONS (this is not an acronym program and 2) through information on the technology maturation and development throughout the rest of the world.

(U) JASONS is a group of approximately 50 appropriately cleared experts who provide detailed independent technical assessment of the most difficult technological problems. JASON members are mostly fully tenured professors in physics, mathematics, engineering, and hold active SCI-level clearances. Output from JASON studies are provided to levels up to the Secretary of Defense and their studies shape programmatic and technical decisions involving literally hundreds of millions of dollars. JASONS were previously funded through university research programs, but their level of technology maturity is appropriate for incorporation into Applied Research.

(U) The technical intelligence program will support collaborative work with the U.S. federal intelligence community on emerging and disruptive technologies, primarily through further development of the Science and Technology Net Assessment studies, which assess a select set of technologies from both a domestic and foreign development perspective. The program will also support collaborative work with international partner nations on emerging and disruptive technology assessments. The technical intelligence program will also support development of tools that enable collaborative analysis of emerging and disruptive technologies.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Technical Intelligence	3.000	3.000	2.911	2.918

FY 2006 Accomplishments:

(U) The JASON studies and Technical Intelligence are focused in areas critical to national security. JASON studies were focused depending on the area most important in the security environment. For the Technical Intelligence portion, supported detailed understanding of technology advancement in important areas of nanotechnology, directed energy, and so forth. Some details are classified, but one effort, called Global Dialogue on Emerging Science and Technology was jointly sponsored by DOD, Department of State, and CIA. This program sponsored several conferences in countries and technologies of interest. These conferences were completely open, but gave very detailed insight in such topics as Software Engineering in India, Nanotechnology in South East Asia, European Laser development, for example. By funding and carefully targeting these opportunities, the DDR&E is able to better shape the Science & Technology (S&T) program.

FY 2007 Plan:

(U) Continue to focus the JASON studies and Technical Intelligence in areas critical to national security. JASON studies will be focused depending on the area most important in the security environment at the time. For the Technical Intelligence portion, support detailed understanding of technology advancement in important areas of nanotechnology, directed energy, and so forth. Some details are classified, but one effort, called Global Dialogue on Emerging Science and Technology will be jointly sponsored by DOD, Department of State, and CIA. This program will sponsor 4-5 conferences in countries and technologies of interest. These conferences will be completely open, but will give very detailed insight in such topics as Software Engineering in India, Nanotechnology in South East Asia, European Laser development, for example. By funding and carefully targeting these opportunities, the DDR&E will be able to better shape the S&T program.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

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APPROPRIATION/ BUDGET ACTIVITY
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0602234D8Z - Lincoln Laboratory Research ProgramPROJECT
P535

FY 2008 and 2009 Plans:

(U) Continue to focus the JASON studies and Technical Intelligence in areas critical to national security. JASON studies will be focused depending on the area most important in the security environment at the time. For the Technical Intelligence portion, support detailed understanding of technology advancement in important areas of nanotechnology, directed energy, and so forth. Some details are classified, but one effort, called Global Dialogue on Emerging Science and Technology will be jointly sponsored by DOD, Department of State, and CIA. This program will sponsor 4-5 conferences in countries and technologies of interest. These conferences will be completely open, but will give very detailed insight in such topics as Software Engineering in India, Nanotechnology in South East Asia, European Laser development, for example. By funding and carefully targeting these opportunities, the DDR&E will be able to better shape the S&T program.

C. Other Program Funding Summary: Not Applicable.**D. Acquisition Strategy:** Not Applicable.**E. Major Performers** Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2		PE NUMBER AND TITLE 0602670D8Z - Human, Social and Culture BehaviourModeling (HSCB)Applied Research						
Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total Program Element (PE) Cost	0.000	0.000	7.300	7.700	9.700	10.000	16.700	19.000
P270 Human, Social and Culture BehaviourModeling (HSCB)Applied Research	0.000	0.000	7.300	7.700	9.700	10.000	16.700	19.000

A. Mission Description and Budget Item Justification: (U). Current military operations need and future operations will demand the capability to understand the social and cultural terrain and the various dimensions of human behavior within those terrains. Behaviors in the social and cultural terrain context extend across the spectrum, from adversaries to our joint U.S. forces, with our coalition partners, and with government and non-government organizations. USG and DoD capstone policy and guidance are driving this need -- as articulated in NSPD-44, QDR 2006, and DoDD 3000.05 (Stability, Security, Transition and Reconstruction (SSTR)). Science and resulting technologies form a resource and base enabler for success in this area. Applied Research in Human Social Culture Behavior Modeling (HSCB) and its counterparts in BA3 and BA4 will develop technologies for human terrain understanding and forecasting in four application pillars: intelligence analysis; operations analysis/planning; training; and joint experimentation. Early priorities to develop the science and technology base will include work in the areas of: Database Infrastructure/Framework; Human behavior based theory for DoD Models; Visualization Infrastructure; and Situationally-relevant education and training tools.

B. Program Change Summary	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)				
Current BES/President's Budget (FY 2008/2009)	0.000	0.000	7.300	7.700
Total Adjustments	0.000	0.000	7.300	7.700
Congressional Program Reductions				
Congressional Rescissions				
Congressional Increases				
Reprogrammings				
SBIR/STTR Transfer				
Other			7.300	7.700

C. Other Program Funding Summary: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY
RDT&E/ Defense Wide BA# 2

PE NUMBER AND TITLE

0602670D8Z - Human, Social and Culture Behaviour Modeling (HSCB) Applied Research

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Not Applicable.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)	Date: February 2007
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APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 2	PE NUMBER AND TITLE 0602670D8Z - Human, Social and Culture Behaviour Modeling (HSCB)Applied Research	PROJECT P270
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Cost (\$ in Millions)	FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
P270 Human, Social and Culture Behaviour Modeling (HSCB)Applied Research	0.000	0.000	7.300	7.700	9.700	10.000	16.700	19.000

A. Mission Description and Project Justification: (U). This project is focused on developing an applied science base and general-use , cross-domain capabilities/tools to support all HSCB applications. The program work will focus on computational/analytical anthropological data collection, theory development, and application methodologies and tools. It will create validated software tools to allow decision makers (Intelligence analysts, operations analysts, operations planners, wargamers) to have available forecasting tools for socio-cultural (human terrain) responses at the strategic, operational and tactical levels. This program will provide data infrastructure/frameworks that will facilitate subsequent model development and validation, human behavior based theory for DoD-relevant models; visualization infrastructures to rapidly assess the human terrain at strategic to tactical levels, and development and mature situationally-relevant education and training tools for disparate user communities.

Database Infrastructure/Framework will facilitate subsequent model development and validation.

Human behavior based theory, for DoD relevant Models, from created software that will allow decision makers to have available forecasting tools for socio-cultural (human terrain) responses at the strategic, tactical and operational levels.

Visualization Infrastructure to rapidly assess the human terrain at strategic levels, and development and mature situationally relevant education and training tools for disparate user communities.

Situationally-relevant education and training tools will focus on computational/analytical anthropological data collection, theory development, and application methodologies and tools.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Data Infrastructure/Framework	0.000	0.000	2.000	2.000

Generation of functional architectures for managing and disseminating socio-cultural data, information and analysis products vertically and horizontally within DoD. Strategies to collect cultural and societal information in denied or difficult to penetrate areas. Development of hand-held/portable tools to collect cultural and societal information.

FY2008 Plan - Development of the methods and tools to allow remote and 'boots on the ground' collection of pedigreed social and cultural information relating to a population (local, regional, global), including the print, voice, and video media, social networks, and cultural, religious and tribal alliances. This work will be focused on areas operation in CENTCOM, PACOM, and EUCOM. The work will identify methods to collect relevant socio-cultural data for Phase 0 - Phase 4 operations.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY
RDT&E/ Defense Wide BA# 2

PE NUMBER AND TITLE

**0602670D8Z - Human, Social and Culture Behaviour Modeling
(HSCB)Applied Research**PROJECT
P270

FY 2009 Plan - Develop technologies capable of collecting and storing multi-source data needed for, storing, displaying and manipulating the massive amounts of data required to conduct the analysis and forecasting of human social and cultural behaviors related to local, regional and global conflict. This will provide DoD with the capability to broadly disseminate socio-cultural data across operational levels (Strategic to Tactical) and between user communities (Intelligence, Influence Operations, Planners).

Accomplishment/Planned Program Title

FY 2006

FY 2007

FY 2008

FY 2009

Human behavior based theory for DoD Models

0.000

0.000

3.000

3.000

Validation techniques for modeling across the spectrum of applications (Intelligence, Influence Operations, Planning)with quantitative models of social-cultural factors in coalition warfare, as well as those social cultural factors of military significant for emerging threats. A human behavior modeling framework that is independent of specific sociocultural values, attitudes and beliefs.

FY 2008 Plan - Creation of validated, human terrain forecasting models that enable examination of 2nd, 3rd, and higher order effects of kinetic and non-kinetic actions within a theater in support of Effects Based Operations. Current modeling is limited to immediate action/reactions and heavily focused on kinetic effects. This work will provide an initial DoD capability to model intended or unintended Political, Military, Economic, Societal, Infrastructure and Information (PMESII) effects of military actions.

FY 2009 Plan - Most models and forecasting tools are built upon experiences in a single region, a single coalition force, etc. and are not generalizable. This project will develop more generalizeable models and tools that can be transposed/reused for other regions of interest, allowing DoD to give more consideration to human, social and cultural factors in early (Phase 0) planning.

Accomplishment/Planned Program Title

FY 2006

FY 2007

FY 2008

FY 2009

Visualization Infrastructure

0.000

0.000

1.150

1.350

Common categorization of meta-information (i.e., the data source and pedigree, what types of uncertainty are associated with it, how old is the data, etc.) in existing visualization tools/decision aiding systems. Methods for visually and digitally depicting the incomplete, subjective, volatile, and/or imprecise nature of cultural information to support manual and automated analysis.

FY2008 Plan - Development of data tagging schemes that support network enabled, collaborative geospatial visualization displays. Within DoD there are multiple sources and venues for the creation and distribution of information and data on human, social and cultural behavior (HSCB). To reuse and represent this data across systems/applications requires the development of new meta-data standards that support visualization/mapping. This effort will investigate the optimal 'common' meta-data standards for the HSCB area.

FY 2009 Plan - Development of visualization methods for displaying uncertainty in common geospatial tools currently used by DoD. The dynamic complexity of human behavior, beliefs and cultures means that there will always be some level of uncertainty to forecasting and mapping the human terrain. It is vital to accurately represent this degree of uncertainty in geospatial toolsets, decision aids, etc. This project will develop generalizable methods/tools for displaying this uncertainty.

Accomplishment/Planned Program Title

FY 2006

FY 2007

FY 2008

FY 2009

Situationally-relevant education and training tools

0.000

0.000

1.150

1.350

Prototypes of training systems capable of using flexible underlying cultural models to train at the operational/tactical level. Training prototype focused on operational scenarios involving negotiation with Middle-Eastern civilian and military forces.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY
RDT&E/ Defense Wide BA# 2

PE NUMBER AND TITLE
0602670D8Z - Human, Social and Culture Behaviour Modeling (HSCB) Applied Research

PROJECT
P270

FY 2008 Plan - Current methods and procedures for integrating cultural information into military operations do not satisfy the requirements for ongoing operations and are not flexible enough to rapidly deliver Just In Time training for complex new regions of interest, and relatively new mission areas (e.g. transition and reconstruction). This project will design training and supporting technologies to speed the development of socio-cultural understanding and the skills needed by individuals, small units, and coalitions in current and future military operations.

FY 2009 Plan - Tactical level kinetic and non-kinetic actions can have a large impact on green force behaviors and beliefs. This project will develop technologies, models, and skills to increase operational effectiveness through the rapid integration of socio-cultural factors into social influence tactics and information operations in current military conflicts. This work will accelerate the development of nontraditional, field capable technologies that enable the training/mission rehearsal of non-technical, adaptive skills related to cultural understanding, interpersonal communication, and teamwork.

C. Other Program Funding Summary

			FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
R&D BA 3	0603670D8Z	HSCB Advanced Development	0.000	0.000	0.009	0.009	0.011	0.012	0.020	0.023	0.000	0.086
R&D BA 4	0604670D8Z	HSCB Research and Engineering	0.000	0.000	0.005	0.006	0.007	0.007	0.013	0.015	0.000	0.055

Comment:

D. Acquisition Strategy: Not Applicable.

E. Major Performers Not Applicable.