Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Office of Secretary Of Defense										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*				R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	93.802	73.583	78.244	0.000	78.244	86.662	102.104	94.681	170.325	Continuing	Continuing
P826: *Quick Reaction Fund*	27.496	20.250	28.822	0.000	28.822	32.333	38.204	35.382	109.341	Continuing	Continuing
P828: *Rapid Reaction Fund*	41.748	34.125	49.422	0.000	49.422	54.329	63.900	59.299	60.984	Continuing	Continuing
P829: *Technology Transition Initiative (TTI)*	24.558	19.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Quick Reaction Special Projects (QRSP) Program supports three separate projects that provide rapid funding to expedite new development and transition of new technologies to the warfighter. The projects that are part of the QRSP are the Quick Reaction Fund (QRF), Technology Transition Initiative (TTI), and the Rapid Reaction Fund (RRF). QRSP provides the flexibility to respond to emergent DoD issues and address technology surprises and needs within the years of execution outside the two-year budget cycle.

The Technology Transition Initiative (TTI), authorized by Title 10 and Section 215 of the FY2003 Defense Authorization Act, facilitates the rapid transition of new technologies from the DoD science and technology (S&T) base into DoD acquisition programs. The program addresses the funding gaps that exist between the time a mature technology is demonstrated and the time it can be funded and procured for use in an intended weapons system or operational capability for the warfighter. The TTI program is mandated by Congress and receives high congressional interest. Since the program inception in FY 2003, 71 projects have been initiated and 32 are complete. Of the 32 completed projects, 24 (75%) have successfully transitioned to DoD Acquisition Programs of Record or procurement contracts for operational use and subsequent fielding; exceeding the objective of 30% for demonstration programs (Strategic Objective 4-3, Office of the Under Secretary of Defense, Acquisition, Technology & Logistics (OUSD (AT&L).

The Quick Reaction Fund (QRF) program is focused on responding to emergent needs during the execution years that take advantage of technology breakthroughs in rapidly evolving technologies. Examples of the types of projects that are envisioned include: accelerating promising research that will enable transformation; or will fill critical gaps in DoD acquisition programs and will last no longer than 12 months; or maturation of technologies critically needed by combatant commanders for operations. Typically these projects are on the technology maturity scale where an idea or technology opportunity is proven and demonstrated.

The Rapid Reactions Fund (RRF) objectives are to leverage the DoD science and technology base and those of the other Federal Departments; stimulate interagency coordination and cooperation; accelerate the fielding of capabilities and concepts to counter emerging threats; and provide feedback to the S&T community to

guide long term developmental strategies. The task force works to anticipate adversaries' exploitation of technology, including available and advanced capabilities. Additionally, the task force works to exploit technology developed outside of DoD in the commercial sector, in academia and international arenas as well as anticipate adversary's application of available and advanced technology. The average length of a RRTO program falls within an 8-12 month range in order to more effectively aid the warfighter. RRF consistently exceeds the transition objective of 30% for demonstration programs (DoD Strategic Objective 4-3). For example, in FY 2009 RRF transitioned 94% of its completed projects to operational use.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	113.924	107.984	0.000	0.000	0.000
Current President's Budget	93.802	73.583	78.244	0.000	78.244
Total Adjustments	-20.122	-34.401	78.244	0.000	78.244
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-7.053	0.000			
• SBIR/STTR Transfer	-2.840	0.000			
• Other Adjustments	-3.690	-0.601	78.244	0.000	78.244
• Congressional Distributed Actions	-6.539	-33.800	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: P826: *Quick Reaction Fund*		
Congressional Add: *2009QRF0018_Research and Development of Arctic Unmanned System*	1.200	0.000
Congressional Add Subtotals for Project: P826	1.200	0.000
Project: P828: *Rapid Reaction Fund*		
Congressional Add: *Augmented Reality to enhance Special Warfare Domain - "Special Warfare Domain Awareness Technologies (SW-DAT)"*	1.600	0.000
Congressional Add Subtotals for Project: P828	1.600	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Office of Secretary Of Defense	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Congressional Add Totals for all Projects	2.800	0.000

Change Summary Explanation

Note: In FY 2011, Technology Transition Initiative (TTI), resources will be transferred from Quick Reaction Special Projects to PE 0603942D8Z (Technology Transfer and Transition) as part of an effort to more effectively align interwoven program efforts that will benefit management communications, budget justification, fiscal tracking and improve overall program resource management of Technology Transfer and Transition efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Office of Secretary Of Defense			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
P826: *Quick Reaction Fund*	27.496	20.250	28.822	0.000	28.822	32.333	38.204	35.382	109.341	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Quick Reaction Special Projects (QRSP) Program supports three separate projects that provide rapid funding to expedite new development and transition of new technologies to the warfighter. The projects that are part of the QRSP are the Quick Reaction Fund (QRF), Technology Transition Initiative (TTI), and the Rapid Reaction Fund (RRF). QRSP provides the flexibility to respond to emergent DoD issues and address technology surprises and needs within the years of execution outside the two-year budget cycle.

The Quick Reaction Fund (QRF) program is focused on responding to emergent needs during the execution years that take advantage of technology breakthroughs in rapidly evolving technologies. Examples of the types of projects that are envisioned include: accelerating promising research that will enable transformation; will fill critical gaps in DoD acquisition programs and will last no longer than 12 months; or maturation of technologies critically needed by combatant commanders for operations. Typically these projects are on the technology maturity scale where an idea or technology opportunity is proven and demonstrated.

On July 10, 2009, the QRF released the FY 2010 Quick Reaction Fund Call For Proposals Memorandum. As noted in the memorandum, the QRF Program provides Components, Combatant Commanders and Force Providers an opportunity to capitalize on emergent technology and to rapidly field-test promising new technology prototypes that can immediately have an impact on military operations. It should be noted that QRF initiatives are limited to those that will deliver a military prototype application within 6 - 12 months of being funded. Projects funded thus far are generally in the dollar range from several hundred-thousand to several million dollars. The QRF program is focused on selecting proposals that have the potential to address disruptive, catastrophic and irregular technologies. More specifically, initiatives that address the following Interest Areas are of particular interest:

- Base Protection
- Bandwidth and Spectrum Enhancement
- Large Data Decision Aids
- Persistent Intelligence, Surveillance, and Reconnaissance (ISR) — must produce field ready demo within one year
- Potential “Red Team” Activity

It should be noted once again that QRF funded projects are typically considered short term efforts, 12 months or less, and are selected to address emergent needs and fill technology gaps. As such, there are no plans to fund the specific projects listed below in the out years. However, FY 2010 and FY 2011 QRF plans include continuing to indentify and fund new projects that are best equipped to respond to critical operational needs and new technology opportunities.

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
2009QRF0001_Mini-Scan Mirror (MSM) - Ultra-Reliable Infrared Countermeasures Beam Director	1.750	0.000	0.000	0.000	0.000

Prior to the initiation of this project, the Office of the Secretary of Defense-Acquisition Technology and Logistics Aircraft Survivability Joint Analysis Team (JAT) found that there were no Infrared Countermeasures (IRCM) beam directors that were suitable (small, light and reliable) for use with small helicopters. Multiple attempts by several vendors to produce a smaller version of conventional beam directors had demonstrated marginal results.

This effort leveraged the smaller and more reliable micro-magnetically actuated Mini-Scan Mirror (MSM) technology developed for another application by the Army and Navy under Small Business Innovative Research (SBIR) in an effort to develop a "game changer" for IRCM applications.

FY 2009 Accomplishments:

1. Delivered three Mini-Scan Mirrow (MSM) prototypes integrated with fiber coupled and direct coupled versions of the Air Force ATADS IRCM laser.
2. Performed laboratory demonstration of the MSM prototypes which included demonstrating the following:
   a. Minimum detectable spectral irradiance of the MSM Pointer-Tracker Fine Track Sensor (FTS) as a function of the Angle-of-Arrival (AOA)
   b. Far field laser intensity across the 2 pi steradians coverage of the MSM Pointer Tracker
   c. MSM Pointer-Tracker scan and slew-and-settle times when given a pointing vector by the Common Missile Warning System (CMWS)
3. Provided report of results from Highly Accelerated Life Testing (HALT), which included the comments on the claim that MSM can achieve 10,000 hours Mean Time Between Failure (MTBF) in field use.
4. Built and tested the hardware and interface specifications for the MSM.
5. Obtained an independent assessment of the TRL level at the completion of the effort.

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
2009QRF0002_Sensor Fusion Improvement Initiative (SFII) Phase 3	0.675	0.000	0.000	0.000	0.000
The purpose of this project is to evaluate the suitability and performance benefits of introducing Naval Cooperative Engagement Capability (CEC) track quality data and fused sensor environment into the NORAD/NORTHCOM (N/NC) sensor grid. CEC is a proven mechanism for integrating diverse sensors into a common, high fidelity, tracking and engagement system capable of supporting an optimized integrated air picture. Because of its inherent, multi-sensor architecture, and the available base of military sensors already configured for CEC use, it offers an attractive means of enhancing and extending the N/NC sensor grid to include multiple, wide-area feeds, including maritime approach data from naval surface and air units operating ashore or at sea in the tidewater Virginia area supporting the National Capital Region (NCR) Integrated Air Defense System (IADS) mission. The primary goal of this effort was to demonstrate and evaluate options (both RF and Land Line) for the introduction of CEC information into N/NC and theater sensor grids and to assess the degree of benefit provided as determined by operations teams within the Combative Command. *FY 2009 Accomplishments:* • Developed and demonstrated in a live environment CEC-N/NC integration prototype (both hardware and software components). • Developed hardware and software specifications and requirements needed for transition to USAF Air Combat Command (ACC) for BC3 program and US Army PEO Missiles and Space for the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor (JLENS) program. • Provided Monthly Progress Reports/Congressional Report/Quad Chart/Program Briefing/After Action Summary/Obligation and expenditure documents. • Developed CONOPS/TTP's for CEC integration into N/NC sensor grid architecture. • Developed an operational "surge" capability to increase surveillance for the NCR IADS mission.					
2009QRF0003_Dogstar (Command Control and Protection of Communications Systems C2CS Protect)	2.400	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Prior to the initiation of this project, the JTF/CoCOM lacked real time situational awareness of critical Cyber resources and means to insure essential C2 functions were available to support C2 of operations. This project used sensors, data fusion tools, and additional security networks as a means to address this issue. *FY 2009 Accomplishments:* Installed advanced network sensors and data correlation tools with respect to Cyber resources; reported lessons learned and measures of effectiveness, which demonstrated a reduction in response time and an improved situational awareness posture; and provided status reports and quad charts.					
2009QRF0004_Rover Compatible SmartCapture Video for Close Air Support Provided a compact, high-quality digital video/voice/data capture and encoder device (called MilSmartCapture), which is Rover compatible, for Close Air Support. This effort permitted rapid dissemination of sensor video to commanders and warfighters for battlefield decision-making. Developed and delivered 20 military grade devices. *FY 2009 Accomplishments:* Delivered military grade 20 MilSmartCapture devices; delivered Quad Charts and status reports.	0.197	0.000	0.000	0.000	0.000
2009QRF0005_Vigilant Sentinel Prior to the initiation of this project, no missile warning system existed that could detect the launch of a shoulder launched missile with high probability of detection and low false alarm rate at an affordable cost. This project completed the development of COTS VIS/NIR electro-optical based system operating in real-time on a Field Programmable Gate Array Processor to detect the launch of a shoulder-launched, Man Portable Air Defense System (MANPADS) with high probability of detection and low false alarm rate.	0.950	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Fabrication, integration, and testing of a Vigilant Sentinel missile warning system along with the supporting documentation. The end result is that the Vigilant Sentinel Missile Warning System uses Visible/NIR sensors, field programmable array processors and innovative algorithms to provide a complete missile defense at affordable costs when combined with a low cost countermeasure.					
2009QRF0006_Standoff Terahertz Human Threat Identification (Phase II)	2.300	0.000	0.000	0.000	0.000
The goal of this effort was to develop an advanced sensor using terahertz (THz) radiation that can detect trace residues of explosives embedded on the hair, skin, and clothing of humans at standoff distances. The objectives of the 3-year Lincoln effort included the following: 1. Measure and characterize trace explosive residues in the hair, skin and clothing of bomb handlers. 2. Assess the feasibility of THz radiation for sensing trace explosives on humans. 3. Build a prototype THz sensor with 20 m standoff range, and with sensitivity sufficient to detect trace explosives embedded in the hair, skin and clothing of humans. 4. Assist the transfer of technology developed under this effort to industry for productizing the instrument for field use. *FY 2009 Accomplishments:* Accomplishments included: I. Phenomenology - Reported the following: a. Reported on explosive residue amounts, their persistence and temporal evolution in hair of bomb-handlers. b. Reported on HE signature analysis on hair and clothing samples from theatre. II. THz Ladar Test Bed - demonstrated the following: a. High power, broadband THz source: 0.5 mW,¬ 0 – 2 THz,					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
b. Low-noise, room-temperature THz receiver: NEP = 40 fW/Hz1/2, 0 – 2 THz c. THz upconversion spectrometer: 0 – 2 THz d. Standoff trace detection system capable of detecting 8 □g/cm2 of explosive residue at 5 m					
2009QRF0007_Angle of Attack Transmitter (AOAT) Probe Torque Tester The objective of this project was to fabricate and demonstrate the utility of a prototype, on-aircraft tester for the angle-of-attack (AOA) probe for the F/A-18 E/F. Prior to the start of this project, AOA probes were functionally checked by hand during aircraft preflight checks. This method provides inconsistent results leading to mission aborts. The ability to detect a failure prior to launch will reduce mission abort rate and help reduce the hazard probability associated with a stuck or binding AOA probe. *FY 2009 Accomplishments:* The following deliverables were provided: 1. Four prototype AOA probe torque tester devices. 2. Test plan and report documenting the results of lab and field testing results. 3. A drawing package suitable for use in manufacturing further torque testers. 4. Calibration procedures. 5. User Manual. 6. Status Reports. 7. Quad Chart s 8. Program Briefings. 9. After Action Summary.	0.162	0.000	0.000	0.000	0.000
2009QRF0008_Mobile Active Targeting Resource for Integrated eXperiments (MATRIX) field demonstration vs. Unmanned Aerial Vehicles (UAVs) The objective for this program was beam control, fire control, and targeting development and enhancements for Airborne Tatical Laser (ATL). Secondary goals included the research and development of a mobile testbed (in a ground or aircraft or future aircraft pod-mounted configuration)	0.750	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
for the operational assessment of active and passive trackers, sensors and system components in the development of tracking, discrimination, targeting and progapation of laser beams and of sensor fusion algorithms and concepts. *FY 2009 Accomplishments:* 1. Development of beam control/fire control for tactical high energy lasers (HELs) 2. Developed testbed (ground and airborne) for assessment of sensing schemes. 3. Evaluation of tracking, discrimination and targeting algorithms for tactical HELs, surveillance and situational awareness missions. 4. Test reports, Quad Charts, Status Reports were delivered.					
2009QRF0009_Micro Air Vehicle (MAV) for Enhanced Support of Cave Detection, Attack Planning, Battle Damage Assessment, and Mission Planning This effort included the integration of COTS components with minimal hardware and interface development resulting in a Small Unmanned Aircraft System (SUAS) for use by ground-based troops to provide enhanced capabilities for detection, characterization, and attack planning with respect to enemy cave targets. *FY 2009 Accomplishments:* Provided an operational demonstration and delivery of a working prototype that included using on-board imaging (video, and still EO & IR) and positional (GPS, IMUs) sensors that were downlinked to the MAV's Ground Control Station (GCS). Additionally, deliverables such as Status Reports and Quad Charts were provided.	1.909	0.000	0.000	0.000	0.000
2009QRF0011_Fuel-Cell-Based Squad Battery Charger The DoD and virtually all branches of the US military will benefit from the portable logistical battery charger and APU based on fuel cells operating on hydrocarbon fuels. High-performance portable	2.020	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
power has been identified as critical in all areas of the military and has the potential to significantly improve portable device performance in terms of weight, cost, run duration and operational capabilities. The electronic requirements for soldier power and battlefield equipment are increasing rapidly, and in many cases, battery technologies are unable to effectively meet demands for extended mission duration and other requirements. The solid oxide fuel cell (SOFC) power systems can provide lightweight, clean, quiet and efficient power for a range of critical portable military missions and devices. This program targeted operation with prepackaged kerosene fuel with exceptionally high energy density and will serve as the basis for future upgrades to run JP8 directly (with future materials improvements). These new power sources will allow the DoD to ship and store fewer batteries and reduce the cost of fuel per watt-hour of energy delivered to the battlefield. Specific advantages include: • Lighter mission weight. For a 3-day, 125 W average power mission, the fuel cell battery charger system, along with rechargeable batteries, is expected to be up to 60% lighter. This represents a 31 kg (68 lb) savings for this mission. For missions where the fuel cell powers equipment directly, the weight savings could be 80% or more. • Lower cost. Equipping six soldiers for a 3-day, 20 W average per soldier mission requires nearly $6,000 in batteries. 72 hours of fuel for the fuel cell costs under $10. Over the expected 2,000 hour lifetime of the charger, the expected savings in primary batteries could exceed $160,000 per unit. *FY 2009 Accomplishments:* Developed and delivered two Fuel Cell Power Systems. Delivered Status Reports and Quad Charts.					
2009QRF0012_Industrial Implementation of Environmentally Friendly Nanometal Electroplating Process for Cadmium and Chromium Replacement using Low Cost Pulse Current Power Supplies	0.500	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Nanostructured Co-based and Zn-based alloys are emerging as viable alternatives to hazardous Chromium and Cadmium plating processes, respectively. While the fundamental process operating windows, related material properties and demonstration/validation testing for the nanostructured coatings are being addressed in various development projects (SERDP and ESTCP projects), a key consideration that is not being addressed in these projects that will help ensure the widespread adoption and implementation of the technology in the DoD and general industry is access to high power output, low-cost pulse plating power supplies. The main objective of the proposed effort is to develop 100kW and 200kW power supplies capable of producing direct current and low frequency pulse and pulse reverse current and to demonstrate that the nanostructured cobalt and Zn-based plating processes are not affected by the new design of these power supplies. The successful completion of the proposed effort is expected to result in alternative technologies for cadmium and hard chrome coatings that provide enhanced material performance and eliminate the need for the toxic and hazardous Cd and Cr6+ electroplating baths. The nanocrystalline coatings would allow for the retention of numerous benefits associated with Cd and Cr coating technologies (i.e., non-line-ofsight application, excellent adhesion, dimensional consistency and superior surface finish) and allow for the use of existing DoD plating infrastructure. This will significantly reduce the time and cost to practical					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
implementation. Implementation of these coating on aircraft and defense related components should lead to improved performance and lower life-cycle costs thereby improving the overall effectiveness of the war-fighter. *FY 2009 Accomplishments:* In addition to demonstrating that the nanostructured coatings can provide adequate performance and producibility the following was also provided: 1. Monthly Financial Reports. 2. Quarterly Progress Reports providing summaries of technical progress on the project for the preceding quarter which also noted any milestones completed and if there are any technical issues affecting the project. 3. Interim Progress Reports. Two Interim Progress Reports were submitted to the ESTCP Weapons Systems and Platforms Program Manager, one at the end of Phase I and one at the end of Phase II of the project. The first report will described the work done on the project from inception to the completion of Phase I and the second will describe work done on the project from the completion of Phase I to the completion of Phase II. 4. Final Report. A final report was submitted to the ESTCP Weapons Systems and Platforms Program Manager at the completion of the project and described in detail all work done in the project from inception to completion.					
2009QRF0013_Computational Research and Engineering Acquisition Tools and Environments (CREATE) Meshing and Geometry Module Development a. The objective of the CREATE program was to develop and deploy new physics-based computationally based engineering (CBE) software tool sets for DOD acquisition programs to use to design, test, and evaluate aircraft, ships and antennas. These software tools will run on current high	0.850	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
performance computers (super-computers) and ultimately on next-generation (N/G) super-computers. Successful completion of this multi-year project will enable the acquisition engineering community to (1) identify design defects and correct them early in the design process before major schedule and budget commitments are made, (2) use live tests to validate a mature design rather than identify the problems in an immature design, and (3) replace experimental prototypes with computational prototypes that can be constructed much more quickly and cheaply. b. The objective of the meshing and geometry project (MG) is to satisfy the need for geometric and meshing models that can be used with multiple software programs and that have a high degree of accuracy. Currently, methods for rapidly generating the required accurate geometries and numerical grids and meshes generally do not exist. The multi-year MG project will produce a comprehensive and integrated set of geometry, meshing and associative attribution software capabilities needed to support computationally-based software tool applications for antennas, ships, and aircraft. These improved techniques for rapid, accurate and scalable generation of analyzable representations for use by CBE tools will provide useful and timely information for making acquisition decisions and developing designs. Phase one of the project will develop a detailed software development plan, a core-architecture design, and identify the attributes for the geometry and meshing software modules needed to support the higher fidelity analysis tools for CREATE and DOD avionics, ships, and antenna acquisition engineers and software developers. *FY 2009 Accomplishments:* a. Provided a documented detailed software development plan. b. Provided a meshing and geometry core-architecture design document. c. Provided Application Program Interfaces (APIs), documentation and skeleton implementation plans for the geometry, mesh and attribution modules of the core Meshing-Geometry infrastructure to CREATE projects.					
	0.400	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
2009QRF0014_Computational Research and Engineering Acquisition Tools and Environments – Aircraft (CREATE-AV) Kestrel Project					
a. The objective of the CREATE-AV project is to develop and deploy new physics-based computationally based engineering (CBE) software tool sets for DOD acquisition programs to use to design, test, and evaluate aircraft weapon systems and modifications. These software tools will run on current high performance computers (super-computers) and ultimately on next-generation (N/G) super-computers. Successful completion of this multi-year project will enable the acquisition engineering community to (1) identify design defects and correct them early in the design process before major schedule and budget commitments are made, (2) use live tests to validate a mature design rather than identify the problems in an immature design, and (3) replace experimental prototypes with computational prototypes that can be constructed much more quickly and cheaply.					
b. Kestrel is the sub-project of CREATE-AV that will address the objective of simulating full fixed wing aircraft carrying stores at realistic flight conditions in the subsonic, transonic, and supersonic flight regimes. The objectives of the first phase of the project were: 1. Identify which functions of existing legacy systems provide prototypes for future software modules. 2. Initiate development of the software architecture to link usable legacy models and features together. 3. Develop new software modules for the aircraft trim and engine thrust models.					
FY 2009 Accomplishments: Accomplishements included: a. Submitted report that provides top-level architecture structure to integrate usable legacy code and computer models. b. Provided codes and supporting software module documentation for an aircraft trim computer model. c. Provided codes and supporting software module documentation for an engine thrust computer model. d. Provided report of results of analysis of usable legacy codes that can be incorporated into the next generation code development.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Office of Secretary Of Defense		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
e. Submitted report that provides results of initial efforts to link software modules and recommendations for future linkage efforts.					
2009QRF0015_SHADOW-Ops Project SO2009-1 - Small Tactical Unmanned Aerial System (STUAS) – Aerodynamic Development for Performance and Flying Qualities Analysis	0.050	0.000	0.000	0.000	0.000
a. The objective of the Computational Research and Engineering Acquisition Tools and Environments – Aircraft (CREATE-AV) project was to develop and deploy new physics-based computationally based engineering (CBE) software tool sets for DOD acquisition programs to use to design, test, and evaluate aircraft weapon systems and modifications. These software tools will run on current high performance computers (super-computers) and ultimately on next-generation (N/G) super-computers. Successful completion of this multi-year project will enable the acquisition engineering community to (1) identify design defects and correct them early in the design process before major schedule and budget commitments are made, (2) use live tests to validate a mature design rather than identify the problems in an immature design, and (3) replace experimental prototypes with computational prototypes that can be constructed much more quickly and cheaply. b. One sub-project within CREATE-AV is Shadow-Operations (Shadow-Ops). The FY09 Shadow Ops objectives are to work with the acquisition engineers in selected DOD program offices to address current problems using existing computational engineering tools and to identify and understand acquisition programs requirements for NG software tool development. The Shadow-Ops teams provide computational tools to solve acquisition engineering problems and provide the acquisition engineers with hands on involvement in how to use these tools. This approach has twin benefits in that it (1) provides CREATE with needed information as to which legacy functions are valuable and (2) provides the acquisition engineering community immediate support and experience to enable better and faster responses. c. Naval small Unmanned Aerial Vehicles (UAVs) have limited data from Computational Fluid Dynamics (CFD) analysis, wind tunnel testing and/or flight testing. The CREATE-AV SHADOW Ops Small Tactical Unmanned Aerial System (STUAS) – Aerodynamic Development for Performance and Flying Qualities Analysis effort will complete generation of an aerodynamic database to be used in					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
simulation tools for engineering analysis and evaluation of flight worthiness and finalize/document a standard process for future CFD aerodynamic database generation to be used in flight dynamics and performance engineering evaluations during early phases of the DoD acquisition process. This will reduce risk in flight dynamics and performance assessments for flight worthiness certifications during initial flight test programs and provide enhanced aerodynamic data to be used in flight clearance assessments and modification assessments for small UAVs. *FY 2009 Accomplishments:* The following accomplishments/deliverables were realized: a. Performed CFD analysis of the process development configurations. b. Provided the aerodynamic model/database of the small UAV and incorporated it into a NAVAIR simulation environment (CASTLE) in the Function Table Lookup format. c. Submited a report of the results of the CFD analysis of STUAS/Tier II (to include lessons learned and elements that can be incorporated into the next generation software.					
2009QRF0016_CREATE AV SHADOW Ops Project SO2009-2: Advanced Performance Analysis of Unmanned Combat Aerial Systems (UCAS) and Unconventional Configurations a. The objective of the Computational Research and Engineering Acquisition Tools and Environments – Aircraft (CREATE-AV) project was to develop and deploy new physics-based computationally based engineering (CBE) software tool sets for DOD acquisition programs to use to design, test, and evaluate aircraft weapon systems and modifications. These software tools will run on current high performance computers (super-computers) and ultimately on next-generation (N/G) super-computers. Successful completion of this multi-year project will enable the acquisition engineering community to (1) identify design defects and correct them early in the design process before major schedule and budget commitments are made, (2) use live tests to validate a mature design rather than identify the problems in an immature design, and (3) replace experimental prototypes with computational prototypes that can be constructed much more quickly and cheaply.	0.050	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
b. One sub-project within CREATE-AV is Shadow-Operations (Shadow-Ops). The FY09 Shadow Ops objectives are to work with the acquisition engineers in selected DOD program offices to address current problems using existing computational engineering tools and to identify and understand acquisition programs requirements for NG software tool development. The Shadow-Ops teams provide computational tools to solve acquisition engineering problems and provide the acquisition engineers with hands on involvement in how to use these tools. This approach has twin benefits in that it (1) provides CREATE with needed information as to which legacy functions are valuable and (2) provides the acquisition engineering community immediate support and experience to enable better and faster responses. c. The CREATE-AV SHADOW Ops Advanced Performance Analysis of UCAS and Unconventional Configurations effort will provide the CREATE-AV conceptual design (CD) project information regarding the interaction between higher fidelity computational fluid dynamics (CFD) analysis and lower fidelity CD. It will also continue analysis of N-UCAS models to increase the fidelity of the maximum lift conditions and pitch control for the carrier landing analysis and identify requirements for smooth (CFD) analysis to support CD in a timely manner. *FY 2009 Accomplishments:* a. Reported on analysis of Next Gen Tactical Fighter alternatives. b. Provided optimization and final aero analysis and optimized grid documentation and computations. c. Status reports and quad charts.					
2009QRF0017_CREATE-AV SHADOW Ops Project SO2009-3 - Joint Heavy Lift (JHL) Concept Refinement a. The objective of the Computational Research and Engineering Acquisition Tools and Environments – Aircraft (CREATE-AV) project was to develop and deploy new physics-based computationally based engineering (CBE) software tool sets for DOD acquisition programs to use to design, test, and evaluate aircraft weapon systems and modifications. These software tools will run on current high performance computers (super-computers) and ultimately on next-generation (N/G) super-computers.	0.050	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Successful completion of this multi-year project will enable the acquisition engineering community to (1) identify design defects and correct them early in the design process before major schedule and budget commitments are made, (2) use live tests to validate a mature design rather than identify the problems in an immature design, and (3) replace experimental prototypes with computational prototypes that can be constructed much more quickly and cheaply. b. One sub-project within CREATE-AV is Shadow-Operations (Shadow-Ops). The FY09 Shadow Ops objectives were to work with the acquisition engineers in selected DOD program offices to address current problems using existing computational engineering tools and to identify and understand acquisition programs requirements for NG software tool development. The Shadow-Ops teams provide computational tools to solve acquisition engineering problems and provide the acquisition engineers with hands on involvement in how to use these tools. This approach has twin benefits in that it (1) provides CREATE with needed information as to which legacy functions are valuable and (2) provides the acquisition engineering community immediate support and experience to enable better and faster responses. c. The CREATE-AV SHADOW Ops Joint Heavy Lift (JHL) Concept Refinement effort completed a conceptual design process for rotary wing configurations. This will provide increased capability to acquisition engineers working with heavy lift aircraft to analyze modification and new design options more quickly. Specifically, the effort will improve aerodynamic description of government design with high-fidelity CFD correlation and provide an enhanced toolset to leverage high-fidelity aerodynamic analysis in preliminary design. *FY 2009 Accomplishments:* a. Provided a report on lessons learned on using the JHL database for valuation of candidate configurations. b. Provided a report on HETR geometry sensitivity analysis results. c. Developed and documented a conceptual design process for rotary wing configurations.					
2009QRF0019_Agile Logistics for Robotics	4.000	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Robotics capabilities are becoming increasingly important in supporting operations associated with asymmetric conflicts. The use of robotics technologies can save lives, reduce costs, and equip forces with new paradigm shifting capabilities. This effort built on previous research and development work needed to advance robotics material handling capabilities. Specifically an unmanned forklift was developed and demonstrated that can operate in semi-structured environments including tactical supply support activities and ammunition storage/holding areas. This work will assist Soldiers in receiving assets, loading and unloading of bulk sustainment commodities and movement to/from bulk storage or unit pick up areas. Robotic material handling equipment can be a force multiplier; improving throughput, customer wait times, and reducing logistics footprint. *FY 2009 Accomplishments:* The primary deliverable was a robotic a proof-of-concept demonstration of an autonomous forklift handling palletized and below pallet loads under human direction. The fundamental capability underlying the demonstration scenario was for the robotic forklift to approach and lift a human-indicated pallet, safely transport the pallet over uneven terrain to a human-specified location, place the pallet at the location, and withdraw.					
2009QRF0020_Thin Disk Ultra Short Pulsed USP) Laser Technology Demonstrator	1.300	0.000	0.000	0.000	0.000
USP Lasers have been demonstrated to have unique effects against military targets of interest. Field testing using a U.S. Navy Transportable Demonstrator System provided by Applied Energetics (AE) has confirmed the effectiveness of USP lasers against specific targets of interest. This effort will produce a demonstration laser system specifically designed to further explore these effects, determine requirements for deployment on U.S. Navy and U.S. Marine Corps aircraft, and be of an architecture that is traceable to producing a “pod mounted” system for installation on a test aircraft. *FY 2009 Accomplishments:* Designed, built, and delivered a multi-mJ USP laser seed source and regenerative amplifier at the base wavelength of 1 micron in an enclosure suitable for use in testing at a customer test facility.					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
The hardware delivered did not include launching optics for the customer testing. Integration with Government provided launching optics and field test support occurred under a subsequent contract.					
2009QRF0022_Vehicle Power and Energy Coating Technology Demonstration – Phase II	1.000	0.000	0.000	0.000	0.000
The DoD is seeking unique power and energy technologies that can increase fuel efficiencies of their vehicles. It is well known that reducing friction in vehicle systems provide an increase in system efficiency. In addition, if a technology can provide additional wear resistance over the baseline systems, life cycle costs can be reduced. A wear resistant, lubricious surface treatment on engine and powertrain components is expected to enable a gain in fuel efficiency of 5% or more. The Army Research Lab Materials Directorate (ARL), UCT Defense (UCTD), and Crane Cams partnered in Phase I to apply and test Nickel Boron-coated ring and pinion gears on an instrumented commercial SUV. Through dynamometer and road tests, the project demonstrated that the coated gears provided a significant performance benefit when compared to baseline gears. The results included a fuel efficiency gain, a 19HP power gain, and a peak torque increase of 21 ft-lbs. The Contractor will apply and test Nickel Boron coatings to High Mobility Multi Wheel Vehicle (HMMWV) and other light duty fleet vehicle ring and pinion components to further demonstrate improvements to fuel efficiency, durability for severe and tactical driving conditions (damage and wear tolerance), improvements to torque delivery (pulling power), and improvements to horsepower delivery (top speed). This will demonstrate the wide applicability and impact this coating can have for the DoD's vehicle fleet. This is a continuation of Phase I efforts focused on fuel efficiency gains realized from Nickel Boron coated ring and pinion components. *FY 2009 Accomplishments:* The following accomplishments were realized:					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Task 1: The Contractor determined the optimum and proper lubrication for Nickel Boron coated ring and pinion gears that result in the lowest parasitic power loss due to friction, viscosity, and heat build-up without compromising the proper function of the lubricant. Analysis and measurement of critical lubricant qualities will be performed. Task 2: The Contractor performed dynamometer testing of coated gears to measure horsepower, torque, coast horsepower, and lubricant temperature profiles. Task 3: The Contractor teamed with an outside test center to perform durability and accelerated life tests using HMMWVs with on optimally coated ring and pinion gears. This full scale testing determined the wear resistance and fuel economy improvements achieved by using the Nickel Boron coating in standard driving conditions. The Contractor also performed baseline tests with standard uncoated ring and pinions on all tests for comparison and quantification of changes realized by coating these components with Nickel Boron. Task 4: The Contractor determined the maximum survivability of coated ring and pinion gears when lubrication is lost, simulating the emergency use of a damaged differential (loss of lubricant) under tactical driving conditions. Task 5: The Contractor defined the optimal coating process through use of Failure Mode Effects Analysis (FMEA), Root Cause Analysis (RCA), and Process Flow determination to begin transitioning the application from development to pre-production readiness. Task 6: The Contractor developed a production readiness package to define the equipment and processes required to transition this application to production with high technical readiness and manufacturing readiness levels (TRL, MRL). The contractor provided the following deliverables:					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
• Monthly progress reports. • Test Plan for Army approval • Test results from all trials. • A production readiness package that enables transition from development to production. • A final report. • All coated components and a description of the coating parameters used to coat the components.					
2009QRF0023_Minimally Manned Force Protection (M2FP) This effort provided enhanced force protection for small teams and expeditionary units working in contested areas and reduced the number of personnel required for monitoring surrounding area allowing them to focus on mission responsibilities. USSOCOM has the requirement to protect minimally manned base camps during contingency operations in remote contested areas. This system has the ability to network, integrate and manage various sensor systems including the SPIDER EO/IR camera detection system, the DRS Squire Radar, and several unattended ground sensors. This is accomplished through a universal translator, allowing a single operator to manage all the different sensors and alert devices. The system can be locally or remotely monitored, and has the potential to trigger text messages when required. *FY 2009 Accomplishments:* This effort combined technical integration (machine-to-machine translation software and interfaces) and operational integration (development of graphical user interface, a common operating environment, and tactics, techniques and procedures (TTP) for employment and use of the system). This system supports force protection in a minimally (U.S. Forces) manned operating base. This result of this effort resulted in a reduction of the number of video displays and controls, as well as the number of personnel needed to monitor and operate the system, while allowing the personnel to effectively monitor a large training facility in a potentially contested environment.	0.975	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Deliverables included: • Provided an integrated system using a common language to feed into a universal translator routed through servers to the main Common Operating Picture (COP) or wirelessly to any capable wireless device. • 2 Servers with ancillary cables and switches. • 2 Server racks with Air conditioning packages • 2 Large screen monitors • 1 SPIDER (EO/IR camera/detection system) with ancillary cables and switches • 1 DRS Squire Battlefield radar with ancillary cables and switches • 40 Unattended ground sensors (UGS)					
2009QRF0024_High Temperature Incendiary Fireball For Facility and HDBT Detect Military forces continue to have limited options when dealing with nuclear, chemical and biological weapons of mass destruction stored in hard and deeply buried targets (HDBT's). This project leverages a technology developed for HDBT air dropped munitions by The defense Threat Reduction Agency (DTRA) and apply them to man portable devices that can be employed by military forces in the field. *FY 2009 Accomplishments:* Will completed a feasibility assessment, design, and technical approach for man-portable high temperature incendiary defeat technology. The final product delivered will be one or more HTIF designs capable of destroying facilities and CW, BW, and NW agents and stores in HDBTs.	0.500	0.000	0.000	0.000	0.000
2009QRF0025_AN/TPS Radar Weather Processing Capability (TWPC) The project objective is to meet a USAF Central Command (USAFCENT) warfighter operational need for a common networked weather radar sight picture across USCENTCOM Area of Operations (AOR) to enhance safety of flight using the AN/TPS-75 (TPS-75) radars currently in theater. The intent of this effort is to mitigate unnecessary risks associated with mission-impacting weather and to provide more time for decision-makers to take required actions (e.g., adjust combat operations or safeguard combat	0.525	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
resources). USAFCENT/A3W estimates 1-2 sorties per year are involved in some level of aircraft mishap which could be avoided with better weather surveillance. Use of existing deployed TPS-75 defense radars will eliminate the need to purchase and deploy additional radars to provide the same data. *FY 2009 Accomplishments:* At completion of this project the following accomplishments will have been realized: Feasibility Study, System analysis and design, Test plan and procedures, Test report that contains verification methods and results of system testing, WEC prototype system, Follow-on contract plan, costs, and timelines to modify up to eight currently deployed TPS-75 radars in the AOR.					
2009QRF0026_Hostile Fire Identification (HFI) using the AAR-57, Common Missile Warning System (CMWS) The proposed action will provide a Hostile Fire (HF) detection capability through the Gen 3 Electronic Control Unit (ECU) scheduled for fielding on the existing Common Missile Warning Systems (CMWS) already installed on the USSOCOM MH-47G and MH-60M rotary wing aircraft. Small arms fire is the most prolific threat to Special Operations rotary-wing aviation and no current capability exists to alert the aircrew to the presence of hostile fire directed at the aircraft. Currently available data suggests when a crew is alerted to the presence of hostile fire survivability increases significantly. The proposed HFI capability will enable the aircrew to employ Tactics, Techniques, and Procedures (TTP) to evade or conduct counter-fire operations and will significantly improve aircrew and aircraft survivability and mission success. Due to the timing of the award, funding will be split between FY09 and FY10 in order to cover the cost of the effort. *FY 2009 Accomplishments:* BAE Systems will provide and sustain two fully operational Gen3 ECUs with User Data Modules (UDMs) and reprogramming accessories for the duration of the Period of Performance (PoP), which will be delivered to the Government at the end of the effort. BAE Systems will provide CMWS	1.850	0.750	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Operational Flight Program (OFP) including HFI software algorithms, Performance Specification, Software Version Description/Version Description Document (SVD/VDD), SIL, and SIT test plans and reports, and live fire test reports. *FY 2010 Plans:* This project, which received an initial increment of funds in FY09, will receivce the remainng funds that were agreed upon in FY10.					
FY 2009, FY 2010, and FY 2011 Funding Some FY 2009 funds remain uncommitted to allow coverage of new starts throughout the fiscal year. Funding decisions are made throughout the execution years in response to emergent COCOM and service requirements, new threats, and new opportunities. QRF projects are typically limited to 12 months or less, but start at different points within a fiscal year. As such, outyear projects are unknown until shortly before the start of a new fiscal year. With this in mind, FY 2010 and FY 2011 projects are not listed; as they have not been identified as of the time of this update. *FY 2009 Accomplishments:* Some FY 2009 funds remain uncommitted to allow coverage of new starts throughout the fiscal year. Funding decisions are made throughout the execution years in response to emergent COCOM and service requirements, new threats, and new opportunities. *FY 2010 Plans:* At the time of this update, only a small portion of 2010 funds were actually available and are in the form of CRA funds. Additionally, FY 2010 Projects have not been identified at the time of this update. As noted above, Funding decisions are made throughout the execution years in response to emergent COCOM and service requirements, new threats, and new opportunities. QRF projects are limited to	1.133	19.500	28.822	0.000	28.822

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
12 months or less and are typically unknown until after the start of a fiscal year. With this in mind, FY 2010 and FY 2011 projects are not listed; as they had not been identified at the time of this update. *FY 2011 Base Plans:* At the time of this update, only a small portion of 2010 funds were actually available and are in the form of CRA funds. Additionally, FY 2010 Projects have not been identified at the time of this update. As noted above, Funding decisions are made throughout the execution years in response to emergent COCOM and service requirements, new threats, and new opportunities. QRF projects are limited to 12 months or less and are typically unknown until after the start of a fiscal year. With this in mind, FY 2010 and FY 2011 projects are not listed; as they had not been identified at the time of this update.					
Accomplishments/Planned Programs Subtotals	26.296	20.250	28.822	0.000	28.822

	FY 2009	FY 2010
Congressional Add: 2009QRF0018_Research and Development of Arctic Unmanned System	1.200	0.000
FY 2009 Accomplishments: This project was established in order to conduct research and development on technologies suitable for application aboard small unmanned aircraft. Work included working with the appropriate Government Agencies to address issues (such as, Detect, Sense, and Avoid capability) which preclude unmanned aircraft from flying in the National Air Space (NAS). Specific areas of focus included: 1. Developing comprehensive standard operational procedures (SOP) for remote and/or arctic small Unmanned Aerial Systems (UAS) deployments and operations. 2. Integrating new payloads onto the UAS airframe and conduct flight test evaluations at the high latitude facilities established in the tasks above.		

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P826: *Quick Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
3. Developed new methods to manipulate the imagery from these new payloads as well as to improve the manipulation of data from existing Electric Optic (EO)/IR payloads. 4. Established arctic flight test areas suitable for experimental testing or evaluation of payload sensors, sense and detect concepts, and operator training. 5. Developed a working understanding of the unique interfaces to integrate payloads into the selected small UAS design architecture through experimentation. 6. Tailored and validated generic risk models (Federal Aviation Administration (FAA) and National Aeronautics and Space Administration (NASA) provided) for UAS flights in civil airspace models for specific high latitude operations. 7. Supported and documented field experiments designed to evaluate the new payloads in real-world high latitude scenarios.		
Congressional Adds Subtotals	1.200	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Including the Congressional Add Project listed above, QRF provided funding to 24 unique projects in FY09. Although each project is unique, all QRF projects were monitored for schedule deviation and transition outcome, as well as for meeting reporting requirements such as periodic status reports, quad charts, financial reporting, and briefing materials. Additionally, some projects were monitored for the delivery of additional deliverables such as test reports, studies, components, and equipment as well.

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P828: *Rapid Reaction Fund*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
P828: *Rapid Reaction Fund*	41.748	34.125	49.422	0.000	49.422	54.329	63.900	59.299	60.984	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Quick Reaction Special Projects Program (QRSP) (Program Element 0603826D8Z) supports three separate projects that provide rapid funding to expedite the development and transition of new technologies to the warfighter: The projects that are part of the QRSP are the Quick Reaction Fund (QRF), Technology Transition Initiative (TTI), and Rapid Reaction Fund (RRF).

RRF is fully executed through the Combating Terrorism Technology Task Force (CTTTF), which was re-designated as the Rapid Reaction Technology Office (RRTO). The CTTTF was stood up to provide rapid response to operations in Iraq, Afghanistan and other theaters in support of the Global War on Terrorism (GWOT) and to accelerate the transition of high-potential science and technology projects into operationally useful products in the execution years. A key focus is to "anticipate" what future Irregular Warfare needs might arise. The dynamics and nature of current conflicts require a venue to prototype new capabilities in anticipation of their potential future need. In FY 2005/2006, CTTTF/RRTO leveraged the DoD science and technology base and those of the other Federal Departments; stimulated interagency coordination and cooperation; accelerated fielding of capabilities and concepts to counter emerging threats; and provided feedback to the S&T community to guide long term developmental strategies. The task force anticipated adversaries' exploitation of technology, including available and advanced capabilities. Additionally, the task force exploited technology developed outside of DoD in the commercial sector, in academia and internationally; as well as anticipated adversary's application of available and advanced technology. In FY2007 RRTO built upon previous experience and pursued projects in: counter cover, concealment and deception in a counter insurgency environment; explored methods and approaches of persistent surveillance stimulation for counterinsurgency; developed alternate power sources for sensors and systems; and expanded human, social and cultural knowledge. In 2008 RRTO focused its projects in the areas of small unit situation awareness, program synchronization, non-kinetic operations, strategic communications, biometrics and forensic applications, persistent surveillance infrastructure, maritime surveillance, small unit dispersed capabilities within specific geographic areas, cross organization / agency sharing , network war concept development and strategic multi-layer assessments. In 2009 RRTO focused its projects in the areas of surveillance system testing, the interface of law enforcement and military operations, strategic communication and influence operations, biometrics and forensics capabilities development, capabilities to support denied area operations, small dispersed unit operations, autonomous system operations, strategic multi-layer assessment and the establishment of an Open Business Cell to facilitate better interactions with small innovative companies that do not normally do business with the DoD. In FY 2011 RRTO will continue to explore new and emerging capabilities to support Irregular Warfare operations. Potential areas for FY 2011 RRTO projects include: FOB protection, persistent surveillance, maritime domain awareness, interface of Law Enforcement and military ops, biometrics and forensics, autonomous operations, operations in cold environments, capabilities to exploit denied areas, strategic communications and multi-layer assessments and nontraditional approaches to leverage innovative businesses. The average length of a Rapid Reaction Technology Office project falls within an 6-12 month range in order to more effectively aid the Warfighter.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Office of Secretary Of Defense		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P828: *Rapid Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Naval Postgraduate School (NPS) IO Threat - Information Operations (IO) to Defeat Coalition Enemies in OEF This project provides expertise and resources to develop IO plans and educate forward deployed staffs. *FY 2009 Accomplishments:* This project provides direct support to Special Operations units deployed in OEF. A faculty led student seminar has been in continuous and direct contact with the deployed SOF headquarters to develop IO plans to support the campaign against coalition enemies. Specific aspects of this program are classified.	0.400	0.000	0.000	0.000	0.000
Asymmetrical Lasercomm for Unmanned Vehicles The goal of this project was to develop and demonstrate small gimbaled modulating retroreflector (MRR) terminals for high bandwidth free space optical (FSO) communications between a base station and an unmanned vehicle with limited payload capacity. *FY 2009 Accomplishments:* Produced and demonstrated an optical communications system that links an unmanned aerial system (UAS) with a ship or shore platform ground station for downloading covert, free streaming video or stored data.	1.405	0.000	0.000	0.000	0.000
Counter-Motivation Block 1 (CMB1) CMB1 will help create a suppression sphere around areas of ideologically-based extremism and terrorism. The intent is to produce targeted products for young and at-risk audiences in the Muslim world and through those products introduce ideas, content, and communication mechanisms that will reduce radicalization.	0.690	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: This program deployed several independent programs into conflict regions using the latest advances in social media and networking technology. Specific activities are coordinated with USD (Policy Global Engagement Office) and SOCOM's Interagency Task Force.					
Griffin Autonomous Unmanned Surface Vehicle (USV) Project This effort will provide a mission level autonomy system for use with multiple unmanned surface vessels. Algorithms developed in support of this project will enable unmanned systems to execute assigned missions with minimal human intervention. *FY 2009 Accomplishments:* This project developed and installed autonomous command and control systems and integrated associated sensors on two USVs. The unmanned systems cooperatively executed a maritime domain awareness task during the Navy's Trident Warrior excercise.	1.600	0.000	0.000	0.000	0.000
U.S. Naval Academy Tracking Transnational Illicit Networks Using New Methods of Analysis & Communication This project was a collaborative research effort involving midshipmen at the United States Naval Academy who identified and analyzed linkages among transnational criminal networks smuggling drugs and other contraband from Latin America or Africa to jihadist terrorists within Europe or the United States. *FY 2009 Accomplishments:* This project provided junior naval officers, with exposure to new analytic tools, skills and knowledge about real and potential links among criminal and jihadist networks. Information from this program is supporting formal open source intelligence on terrorist and criminal activity.	0.200	0.000	0.000	0.000	0.000
	0.600	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Foliage Penetration Reconnaissance, Surveillance, Tracking and Engagement Radar (FORESTER) Enterprise-Based Exploitation (FEBE) The objective of the FEBE effort was to rapidly develop and demonstrate an automated exploitation tool that processes detections from the FORESTER radar and automatically detects activity, suppresses persistent false alarms and discriminates between people and wildlife. *FY 2009 Accomplishments:* This effort developed algorithms and software that performs automatic processing of FORESTER data to allow non-expert users to rapidly and reliably detect areas of significant activity, while rejecting false alarms and non-threat activity. The project also allows FORESTER operators to discern friendly forces. FORESTER, a DARPA project, will transition to SOCOM.					
Afghan Counter Insurgency (COIN) Web Portal – Program for Culture & Conflict Studies: A Web Gazetteer for the 21st Century This project allowed the expansion and development of materials to include more detailed tribal maps, provincial and district summaries, political and tribal leadership profiles, and security analysis reports. This development work provided relevant research in support of current COIN and reconstruction programs in Afghanistan. *FY 2009 Accomplishments:* This project expanded and developed ongoing research and dissemination of socio-cultural / human terrain information on Afghanistan via an open-source web portal. It provided comprehensive assessments of tribal and clan networks in coordination with ongoing COIN operations and needs. It is used by U.S., NATO ISAF and non-governmental organizations in Afghanistan.	0.200	0.000	0.000	0.000	0.000
Project Anubis	1.300	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
The objective of this project was to develop, prototype, and test Non Line of Sight munitions with man-in-the-loop target ID with very low collateral damage as a proof of concept effort. The ANUBIS capability will give the tactical user an offensive capability against immediate threats. *FY 2009 Accomplishments:* The effort achieved longer range and time of flight as well as more precise lethality against different target sets than currently fielded squad level capabilities. ANUBIS systems are deployed to Afghanistan awaiting an operational demonstration.					
Multiple Heterogeneous Cooperative UAVs Technologies Developing a cooperative multiple UAV system that provides warfighters with capabilities to continuously collect intelligence, conduct surveillance, and perform reconnaissance for mission planning and execution, friendly force protection, and exploitation of enemy weaknesses. *FY 2009 Accomplishments:* The project has performed the necessary tests and refinement of multiple UAVs technologies for operational deployment. In addition, the project has designed and developed a standard multiple UAVs control, sensor fusion, and integrating software system in a compact, deployable unit suitable for a variety of small UAVs. Algorithms developed for this project are also supporting the Griffin project.	0.450	0.000	0.000	0.000	0.000
Smart, Lightweight Infra-Red Polymer Emitters for Vehicle Mounted Identification, Friend or Foe (VMIFF) Supported further analysis of novel lightweight and low cost devices for remote identification using polymer based light emitting diodes (PLED). *FY 2009 Accomplishments:* This effort produced four ruggedized VMIFFs for use in Cobra Gold experimentation and field tested new VMIFFs for remote activation from ground laser target designators (GLTD). The project	0.250	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

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demonstrated a significant improvement to be able to detect friendly vehicles at great standoff distances. Additional products are being transitioned to operational use.					
Afghan Virtual Science Library (AVSL) Pilot at Kabul University The pilot Afghanistan Virtual Science Library at Kabul University offered students, scientists and engineer's access to international scientific, engineering, and technical journals and professional resources. Based on this pilot, the U.S. Civilian Research & Development Foundation (CRDF) developed a plan to extend the capacity to other universities and to Afghan government ministries. *FY 2009 Accomplishments:* The pilot project delivered a fully deployed functional website and VSL rollout assisted by key staff members of Kabul University and a project brief to the Afghanistan Ministry of Higher Education.	0.175	0.000	0.000	0.000	0.000
Common Operation Research Environment (CORE) Program The intent of CORE is to leverage evolving analytical technologies to educate the officer corps on how to apply theoretical concepts to the problems of terrorism and irregular warfare. *FY 2009 Accomplishments:* This funding has expanded the Common Operational Research Environment (CORE) Lab's capability by incorporating additional analytical tools. CORE activities include education of students at the Naval Postgraduate School (NPS) and direct support for specific operations. The CORE Program has transitioned to the NPS curriculum. Analysis products generated by CORE students have been used by the operational special operations organizations.	0.355	0.000	0.000	0.000	0.000
Software Reprogrammable Payload (SRP) Electronic Attack (EA) Waveform Development The demo will highlight the ability to port communications and intelligence, surveillance, and reconnaissance (ISR) applications across space and terrestrial domains and deploy aboard various	0.600	0.000	0.000	0.000	0.000

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	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
hardware platforms. Enabled by Government owned intellectual properties to enable sharing of waveforms and applications. *FY 2009 Accomplishments:* Assisted with demonstration and software development to support the application architecture. The capability will give users the ability to change mission applications without having to change hardware.					
Data Aggregation, Analysis, and Visualization for Violent Non-State Actor Networks with Spatial and Temporal Attributes The Institute for the Study of Violent Groups (ISVG) at the University of New Haven will perform technical aggregation and fusion of multi-cultural and multi-lingual data sources to allow for automated discovery of hidden and unseen attributes and relationships between criminal groups, terrorist groups, and extremist organizations. *FY 2009 Accomplishments:* Provided a new data source and analytical capability through aggregation and fusion of multi-cultural and multi-lingual datasets to Special Operations Command Pacific (SOCPAC) and the Joint Interagency Task Force South (JIATF-S) for analyzing and understanding violent non-state actor networks and transnational threats in their areas of responsibility.	0.950	0.000	0.000	0.000	0.000
Defense Analysis Insurgency & Manhunting Projects This work combines the COIN model with decision making tools. Interactive modeling allows users to change parameters, and test new alternate courses of action, that in turn influence the outcome of the insurgency. It also allows the user to test the assumptions of policy decisions. *FY 2009 Accomplishments:* This project built a dynamic model of insurgency that clearly defines the variables, parameters, and relationships that shape the outcome of insurgent competitions. This Naval Postgraduate School	0.415	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

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program involves students and supports specific military operations. This program is usd by the Naval Postgraduate School to support US Forces Afghanistan with requests and requirements.					
Intelligence Surveillance & Reconnaissance – Situational Awareness Tool (ISR-SAT) ISR-SAT combines a proven, fully developed and National Geospatial-Intelligence Agency (NGA) validated geo-location technology with an existing integrated situational awareness platform using National Technical Means (NTM) data and mapping. *FY 2009 Accomplishments:* This combined effort provided an improved time critical exploitation and targeting decision process, resulting in actionable intelligence against High Value Targets (HVT). This is operational in NGA.	0.422	0.000	0.000	0.000	0.000
Transitioning From Counterinsurgency to Lesser Forms of Engagement This effort provided recommendations on the procedures and capabilities required to successfully transition from counterinsurgency (COIN) operations to some lower level of conflict, to include police-led operations, peacekeeping and/or the training and equipping of local forces. The objective is to identify specific science and technology areas that could potentially support and enhance the transition from counterinsurgency operations to a lower level of conflict. *FY 2009 Accomplishments:* This research has identified procedures and specific capabilities required by the Department of Defense (DoD) and other U.S. government agencies in order to transition successfully from COIN to sustained stability operations.	0.550	0.000	0.000	0.000	0.000
Mobile Modular Command and Control (M2C2) M2C2 provides on-the-move, over-the-horizon (OTH) communications and digital command and control (C2) capability. The M2C2 systems include an integrated suite of tactical radios, broadband satellite	1.100	0.000	0.000	0.000	0.000

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communications, and staff kits with processor/display hardware, battalion-level tactical applications, secure wireless network connectivity, and tactical intercom. *FY 2009 Accomplishments:* The M2C2 provides an immediate and transitional solution to the long-standing operational force requirement for an OTH Command and Control capability. The M2C2 capability has been installed, tested and delivered in a Cat 1 MRAP vehicle. M2C2 has deployed to Afghanistan with the Marine Corps.					
Joint Urgent Operational Need (JUON) Application for Joint Staff/OSD This project provided continued improvements for the Joint Chiefs of Staff Knowledge Management Decision Support (KM/DS) JUON application, and supported work flow management and improved information sharing within the Rapid Acquisition Community of Interest (COI). As a module of KM/DS, the JUON Application implements workflow management, and a structured feedback process. *FY 2009 Accomplishments:* This initiative has provided greater visibility and control of the JUON process, and has expedited communications and workflow throughout the Rapid Acquisition COI. The end result provides for better JUON and Immediate Warfighter Need (IWN) accountability and more rapid resolution of urgent Warfighter needs. This tool has enabled life saving capabilities to get to the Warfighter faster.	0.400	0.000	0.000	0.000	0.000
Children's Arabic Media for Prevention of Radicalization This project focused on understanding and finding resources for prevention of radicalization among Arab children. The researchers, specialists in children's education and fluent in Arabic, identified the key criteria appropriate for children in the prevention of radicalization, found Arabic media for children which met these criteria, and provided copies of the media to the DoD funded counter-radicalization media repository at the University of Maryland (UMD).	0.350	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

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FY 2009 Accomplishments: Identifying such creative works, and understanding which ones to select and why, provides a concrete reach-back resource for those developing Arabic school curricula (e.g. in Iraq) and building counter-radicalization programs. Also, this contributes to a publicly accessible repository, thereby overcoming the current stove-piping of counter-radicalization research efforts.					
Support Combatant Command (COCOM) Planning Using Causal Frameworks This project has improved the COCOM ability to develop and assess Theater Campaign Plans and facilitate coordination of planning and assessment among COCOMs and interagency partners. It provides near term insight and support to a specific COCOM and considers how framework development and customization can effectively support broader COCOM planning, compliance with planning and assessment requirements of Guidance for Employment of the Force (GEF) and the Joint Strategic Capabilities Plan (JSCP). *FY 2009 Accomplishments:* This effort has provided a systems framework that could accelerate the understanding of complex threats and facilitate discussions into complex regional/global operating environments. The product is being reviewed by a COCOM. This has been completed and transferred to the Joint Staff.	0.403	0.000	0.000	0.000	0.000
Mission Fabric This project has built a meshed digital network that is a new situational awareness architecture enabling collaboration and decision making in a distributed environment. The Mission Fabric is the engine for executing Flexible Distributed Control. Flexible Distributed Control is a disruptive process weaving the virtues of social networking innovations into a distributed group-action Mission Fabric.	0.875	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

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FY 2009 Accomplishments: This effort allows self-organizing, dispersed groups to immediately synchronize their efforts for temporal opportunities to support the commander's intent. This effort supports enhanced interagency coordination. It will be evaluated during an Interagency exercise in FY 2010.					
Stand-off Optical Detection of Trace Explosives This effort is designing a man portable, stand-off Remote Explosives Detector (RED). The system employs eye safe IR lasers to detect sub-milligram traces of explosives at 10+ meter standoff distances. This system is being designed and produced in several phases. *FY 2009 Accomplishments:* Field tests of this capability produced very promising results. The current phase of the project has designed a compact ruggedized, stand-off Remote Explosives Detector (RED) that will be evaluated in FY10.	1.600	0.000	0.000	0.000	0.000
Multi-Sensor Trip Wire System This project employs power lines as a bistatic radar to provide affordable persistent surveillance for facility, perimeter and border security with proven communications capability to transmit intrusion detection alerts to security authorities. *FY 2009 Accomplishments:* The initial assessment showed the capability to detect various targets along a linear power line. The system is able to provide ground and air surveillance capable of discriminating targets of interest including people, vehicles and low flying aircraft.	0.711	0.000	0.000	0.000	0.000
Strategies for Winning Net Wars	0.205	0.000	0.000	0.000	0.000

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The objectives of this work are to provide the military, government agencies, and law enforcement with knowledge and tools to deter, undermine, and defeat criminal, state and non-state supported actions—enacted wholly or in part through the internet and cyber space—that threaten the US, its interests and allies. *FY 2009 Accomplishments:* The outcomes of this effort identify important factors underlying the organization and operation of criminal and terrorist groups as networks in physical and cyber space, and develop knowledge, organization, and response options to deter, undermine, and defeat these networks. This work is completed and is employed as instructional material at the Naval Postgraduate School.					
Netwars on the US Borders This effort represents a proof of concept investigation of networked forms of organization among criminal and terrorist networks operating across US borders that take advantage of areas outside of effective US government control. *FY 2009 Accomplishments:* This understanding of the structure and functioning of criminal networks operating across US borders is helping the USG organize and operate more effectively to defeat these types of networks outside the US. The knowledge gained in this effort is informing the development of a pilot program for initial application at US borders and subsequent application outside the US. It is being developed in coordination with U.S. Northern Command Joint Task Force North.	0.235	0.000	0.000	0.000	0.000
Cat Eyes This project has developed a rugged dual use, commercial off the shelf, autonomous (ground and aircraft capable) low light surveillance camera system with automated target recognition software and embedded geo referencing and target mensuration.	0.900	0.000	0.000	0.000	0.000

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FY 2009 Accomplishments: The system has incorporated a cooled Electron Multiplying Charge Coupled Device (EMCCD) technology for improved sensitivity over previous low light camera systems. The system will be turned over to SOCOM units and counter narco-terrorism units operating in Afghanistan for operational evaluation.					
Persistent Sensor Integration Demonstration (PSID) Riverine This project will demonstrate the deployment and operation of a river-based fiber optic backbone system to support persistent sensor connectivity in a triple canopy environment where RF communications are limited/impossible. *FY 2009 Accomplishments:* The ultimate goal of the current effort is to conduct a System Technical Demonstration in a Riverine-like environment with Warfighter participation. The capability will provide better situational awareness to tactical operators. The initial demonstration is scheduled for 1st quarter FY 2010.	0.850	0.000	0.000	0.000	0.000
Submerged Launch System for a Fuel Cell Powered Long Endurance Expendable Unmanned Aerial System (UAS) for ISR The Naval Research Laboratory has developed a Fuel Cell Powered Long Endurance UAS for ISR. The project will develop a submerged launch capability for the UAS. *FY 2009 Accomplishments:* This project has integrated a novel UAV aboard a standard submarine launch canister to provide the Navy an extended reach ISR asset equipped with a high quality real-time video.	0.600	0.000	0.000	0.000	0.000
Trade Space Support to UAV	0.300	0.000	0.000	0.000	0.000

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The Applied Research Laboratory/Penn State University (ARL/PSU) has developed trade space exploration and decision support tools to support UAV operations for the Navy's Trident Reach deployment, which will be operating MQ-9 Reapers with multiple sensors in an Overseas Contingency Operations (OCO) mission. *FY 2009 Accomplishments:* The trade space tools were tailored to two related domains (1) Decision support for employing the UAV sensor suites and (2) Trade space exploration in support of network analysis.					
Accelerating Integrated Patient Care Solutions In support of DoD objectives for joint patient movement, this project will accelerate (1) the development and fielding of important software / data system feature enhancements for the DARPA/Army MedEx 1000 "suitcase ICU", (2) development and fielding of improved power system capabilities for the MedEx 1000; and (3) development of a method to secure the MedEx 1000 to a NATO litter other than using the Special Medical Emergency Evacuation Device (SMEED) patient shelf which limits patients access. *FY 2009 Accomplishments:* This effort supports the Department's Wounded Warrior Program and will enhance patient survivability. Once validated, the capabilities will transition to ARMY, SOCOM, and NAVY.	1.140	0.000	0.000	0.000	0.000
Civil Counterinsurgency (COIN) Under Fire The premise of this study is that new integrated civil-military concepts of operation (ICONOPS) for counterinsurgency, tailored for the local context and threat environment, will enable counterinsurgents to better integrate and balance civil and military efforts. These integrated operational concepts should provide a basis for practical steps that will help counterinsurgency planners and operators solve the central problem: how to implement civil measures effectively and manage risk in contested and violent areas to help establish the legitimacy, effectiveness and reach of the host government.	0.050	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

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FY 2009 Accomplishments: The approach developed in this project will improve the overall COIN effort, with the goal of helping to shift the burden for civil COIN away from US military forces by providing integrated approaches that permit the civilian side to take on a larger share of the burden in violent areas. Project has proposed new counterinsurgency integrated concepts of operations and required technical capabilities that should affect joint and service doctrine and Tactics, Techniques and Procedures (TTPs), as well as those of interagency partners.					
DURAD Beckham This effort developed a lower cost miniaturized version of an earlier classified RRTO project. This capability assists the Warfighter in detecting areas of interest from a standoff distance. *FY 2009 Accomplishments:* This project enables Central Command (CENTCOM), Special Operations Command (SOCOM), Southern Command (SOUTHCOM), and other military users to discover and geolocate the position of certain systems which have been known to be associated with terrorists. This effort is executed by DIA.	0.600	0.000	0.000	0.000	0.000
National Tactical Means (NTM) Phase II This project will implement the use of NTM as part of the Thunderstorm sensor and data network to enhance tactical user support. Further details are classified. *FY 2009 Accomplishments:* This project demonstrated the utility of NTM under direct control of the Warfighter. It developed the tactics, techniques and procedures to be used in the future. Further details are classified. The services will be involved in the demonstration and Concepts of Operations (CONOPs) development to maximize transition success.	1.600	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P828: *Rapid Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Wide-Area Infrared System for Persistent-Surveillance (WISP) The effort has enabled night capable persistent surveillance over large areas. This capability maps to both forensic analysis and tactical downlink. *FY 2009 Accomplishments:* The Air Force Big Safari wide area persistent surveillance program has a requirement for wide area day/night performance. The Air Force has expressed interest in WISP to provide day/night wide area capability if the prototype system is demonstrated. *FY 2010 Plans:* Development of a hemispherical field of view Long Wave Infrared (LWIR) sensor system with 100 µradian pixel angular resolution and 1.5 second field of regard update rate. The system will enable mover detection over the hemispherical field of regard out to ranges greater than 5km.	1.300	1.500	0.000	0.000	0.000
SeaStalker This effort incorporated a suite of Intelligence, Surveillance and Reconnaissance (ISR) sensors into a modified 38-inch diameter Seahorse Unmanned Undersea Vehicle (UUV). The vehicle is capable of navigating submerged to the target where it will surface to collect data. The data is transmitted via satellite to the control platform and operational users. *FY 2009 Accomplishments:* This project provides a persistent ISR platform with broadband over the horizon connectivity that can serve as a remote station allowing the host platform to remain out of sight and simultaneously conduct other missions. SeaStalker conducted an operational demonstration in FY09. Lessons learned are being incorporated in order to develop a more capable system. This effort has transition to the Navy.	0.626	0.000	0.000	0.000	0.000
Enhanced National Tactical Coordination	1.600	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
This effort has provided the Tactical Exploitation System (TES) Officer-in-Charge the ability to coordinate the operations of selected National and Tactical assets. Further details are classified. *FY 2009 Accomplishments:* This effort resulted in leave behind capabilities in the TES.					
Operationalized worldwide Specific Emitter Identification (SEI) This project has moved the worldwide SEI capability from demonstration to full operations. More information is available at a higher classification level. *FY 2009 Accomplishments:* This project provides joint intelligence centers and tactical forces with identification data needed to locate and track specific targets and correlate on-board and off-board information. This effort has resulted in leave behind capabilities both in the planning and processing systems.	1.000	0.000	0.000	0.000	0.000
Aircraft-Based Electronic Warfare Demonstration This project demonstrated the utility of an Electronic Warfare (EW) suite when fitted in a Commercial-Off-The-Shelf (COTS) low life cycle cost aircraft during Thunderstorm Spiral 2. *FY 2009 Accomplishments:* The EW suite was flown in the controlled and scripted environment of Thunderstorm Spiral 2. The utility results of the EW system is available for assessment by a cross section of the Intelligence, Surveillance, and Reconnaissance (ISR) community.	0.150	0.000	0.000	0.000	0.000
Wide Area Video Exploitation Library (WaveLib)	0.969	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
WaveLib was developed as a modular toolkit of video processing functions designed to ingest raw imagery and metadata from wide area airborne sensors, such as Constant Hawk, and produce accurately geo-stabilized contrast-enhanced imagery, vehicle detections and tracks. *FY 2009 Accomplishments:* The modular toolkit can be easily integrated with 3rd party Wide Area Persistent Surveillance (WAPS) exploitation tools. Toolkit functions improve geo-location accuracy, probability of detection, automatic track duration, and processing speed, while reducing false detections. The library enables analysis to develop actionable intelligence with improved speed and accuracy.					
Motion Detection and Classification This effort developed software to detect activity in wide-area video of an area of interest (AOI), without relying on tracking. *FY 2009 Accomplishments:* The software enables analysts to detect and track suspect vehicles arriving at or departing from an AOI with greater accuracy. In addition, analysts are able to detect dismounts from vehicles within an AOI. The result of this effort will enable faster analysis of video data.	0.486	0.000	0.000	0.000	0.000
Large Enterprise Scale Data Extraction/Compression Software has been developed to provide accelerated extraction of imagery data from storage, adjustable streaming compression, and spatial-temporal archival compression. *FY 2009 Accomplishments:* The new capabilities are being integrated and demonstrated in an open manner to allow for rapid integration into other exploitation tools. The integrated software application will be available to the Wide Area Persistent Surveillance (WAPS) community including National Geospatial-Intelligence Agency (NGA), and the Counter-IED Operations Integration Center (COIC). It will be used in support	0.605	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
of analysis of data from existing wide area surveillance electro-optical formats, including Constant Hawk.					
Supercavitation The Applied Research Laboratory of Penn State University (ARL/PSU) leveraged an existing ONR-funded supercavitating vehicle field test program to provide a low cost continuation of their exploration of supercavitation physics. *FY 2009 Accomplishments:* This effort has helped to further the understanding of the phenomenology of supercavitation propulsion of torpedoes.	0.200	0.000	0.000	0.000	0.000
Counter Swarm Tactics This effort built a computer simulation model of asymmetric naval swarm tactics, and used it to design and test counter-tactics to disrupt swarm attacks. *FY 2009 Accomplishments:* The projects demonstrated the feasibility of using a small group of Unmanned Surface Vehicles (USVs) to disrupt asymmetric swarm tactics.	0.250	0.000	0.000	0.000	0.000
Project Blind Roc A portable system designed to control certain mobile communication devices is being developed under this project. This project allowed for additional validation tests to occur using flying and seaborne communications links to more accurately represent real world applications.	0.125	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: The Blind Roc system was tested in a scenario which employs the radio frequency and kinematic characteristics of a real world application of the technology. This allows the developer to fully understand how platform range, movement, altitude and orientation impact system performance.					
Intelligent Mobile Sensor Barrier (IMSB) This project has developed an integrated, persistent, at-sea surveillance system to detect, monitor and support interdiction of self-propelled semi-submersibles (SPSS). The initial phase developed a feasibility assessment for deployment of a robust fixed and mobile acoustic sensor barrier to detect target maritime vessels. *FY 2009 Accomplishments:* IMSB will provide a significant increase in autonomous, persistent detection and time-critical alert capabilities to enable airborne or sea-based threat acquisition and interdiction by US and host-nation forces.	0.500	0.000	0.000	0.000	0.000
Inflatable Satellite Communication (SATCOM) The United States Marine Corps (USMC) required a lightweight, portable SATCOM Antenna as an alternative to the current family of deployable SATCOM antennas. This product is significantly lighter and smaller to transport, yet provides equivalent or superior performance. *FY 2009 Accomplishments:* This project decreased the total number of transit cases necessary to field Support Wide Area Network (SWAN) SATCOM Terminals and the Lightweight Multiband Satellite Terminal (LMST), saving space and weight. In addition it is now possible to include an antenna with a larger aperture on the SWAN terminals and still realize a size/weight savings. The Inflatable SATCOM capability has operationally deployed with the Marines.	0.295	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Building Effective States	0.421	0.000	0.000	0.000	0.000
This pilot project delivered a proof of concept for the practical implementation of the existing Institute for State Effectiveness (ISE) framework in any USG entity, develop practical tools for developing country specific strategic plans and deliver an actionable plan to be implemented by a U.S. country team. *FY 2009 Accomplishments:* This project enhances the military understanding of and ability to support the task of building effective states. More broadly it serves to identify gaps and necessary tools to enable the broader USG to develop better approaches to enhancing security. This effort is being executed by the Army.					
Strategic Multi-Layer Assessment (SMA) Effort	3.000	3.000	0.000	0.000	0.000
The objective of this effort was to support and participate in an interagency experiment to demonstrate and measure the effectiveness of an analytical process within a virtual collaborative environment (VCE) to anticipate and find leading indicators of acts of terror, use of weapons of mass destruction (WMD) or other high profile acts. Each SMA focus area is in direct response to a COCOM request. *FY 2009 Accomplishments:* SMA virtually and collaboratively brought together analysts from diverse agencies with multi-disciplinary social science modeling and analysis (SSM&A) experts drawn from industry and academia to: (i) leverage the understanding social science modeling and analysis tools and experts within the SSM&A reach back cell can provide analysts for a given rare event threat scenario, (ii) share tradecraft and expertise in interpreting data, (iii) expand the knowledge base applied to the problem, and (iv) rank possible enemy courses of action from a multi-sourced set of data using various criteria and multiple priorities. *FY 2010 Plans:* SMA virtually and collaboratively will bring together analysts from diverse agencies with multi-disciplinary social science modeling and analysis (SSM&A) experts drawn from industry and academia					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
to: (i) leverage the understanding social science modeling and analysis tools and experts within the SSM&A reach back cell can provide analysts for a given rare event threat scenario, (ii) share tradecraft and expertise in interpreting data, (iii) expand the knowledge base applied to the problem, and (iv) rank possible enemy courses of action from a multi-sourced set of data using various criteria and multiple priorities. Specific projects are being conducted in direct support of US Forces Afghanistan.					
Idea Management System The objective of the Open Business Cell (OBS) (online at DefenseSolutions.gov) is to reach out to smaller innovative companies, including those who have no experience dealing with the Department of Defense. The program, still in a prototype phase, selected Battlefield Forensics as a topic. The OBC uses the Idea Management System (IMS) to collect, track, evaluate, and store all ideas submitted to the DefenseSolutions.gov website. This effort made improvememts to the tracking system focusing on communications and autonomous filing and organization that will send, receive, automatically sort and file pertinent correspondence. *FY 2009 Accomplishments:* This project's package of improvements alleviated the manual insertion of important messages, attachments, ideas, proposals, and initial evaluations into the IMS system. These improvements enabled more efficient assessment of proposals and selection of valid projects.	0.356	0.000	0.000	0.000	0.000
Lanthanide Oxide Nanoparticles This effort demonstrated a new method of developing latent fingerprints from documents without the need for the current "fuming techniques. This method uses lanthanide oxide nanoparticles functionalized to specifically bind fingerprint residue and provide for fluorescence detection under ultraviolet illumination. This project is being executed through the Open Business Cell (OBC).	0.400	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Instead of taking evidence back to a lab for complete fingerprint analysis, this effort enables the Warfighter to complete the entire process in the field on both paper evidence and larger objects.					
Battlefield Multi-Test Kit This project delivers three prototype Battlefield Multi-Test Kits. Each kit contains colorimetric tests that presumptively identify the presence of explosives, gunshot residue (GSR), and drugs. This effort is being executed through the Open Business Cell (OBC). *FY 2009 Accomplishments:* The Multi-Test Kit enables the Warfighter, with minimal training, to quickly identify high risk indicators, specifically, the presence of explosives, GSR, and drugs.	0.151	0.000	0.000	0.000	0.000
Integrated Multi-Test Sensor Systems Developed an integrated multi-dimensional sensor system that provides for real-time fast forensic analysis of unknown chemical materials that may be encountered by battlefield soldiers, first responders, law enforcement officials and transportation administration agents. This effort is being executed through the Open Business Cell (OBC). *FY 2009 Accomplishments:* This effort resulted in a low-cost, lightweight and low power handheld device capable of detecting a wide range of chemicals with high reliability and sensitivity.	0.225	0.000	0.000	0.000	0.000
Digital Imaging Device This effort developed algorithms and a software prototype to support forensic investigations on digital images associated to cell phones. This effort is being executed through the Open Business Cell (OBC).	0.400	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: The project created a small, rugged prototype device that interrogates cell phones with cameras to determine if stored images were captured by the phone's integrated camera or were received into memory from some other source, such as a website, scanner etc.					
Tunnel Detection This effort provided a rapid, accurate, and decisional test area that will recommend prototype testing and research and development to meet US NORTHCOM, US CENTCOM, and US SOUTHCOM force protection program goals. The facility will host various types of tunnels ranging from small unsupported structure to larger tunnels with power and rails. This test site will enable capabilities to detect tunnels used to smuggle material across borders or prisoners escaping detainment facilities. *FY 2009 Accomplishments:* A facility was constructed that allows technology discrimination for mission applicability and economy; provide decisional test documentation and archival library for proposed technologies; enable visible documentation and performance matrix for selected technologies; and allows untainted data for investment decisions for chosen programs.	1.000	0.000	0.000	0.000	0.000
Project Thunderstorm RRTO and interagency partners developed the concept of operation in FY 2009 or an enduring ISR Test Bed, Thunderstorm, using Joint Interagency Task Force-South (JIATF-S) AOR to demonstrate in an operational environment multi-int sensor and exploitation systems integration. *FY 2009 Accomplishments:* Thunderstorm allows OSD to develop ISR CONOPS and facilitate future ISR capability development while providing JIATF-S improved intelligence.	3.608	3.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: Spiral 3 is tentatively planned for February 2010.					
Joint Experimental Range Complex (JERC) Support Maintain a joint force protection team and infrastructure at Yuma Proving Ground (YPG) capable of testing and reporting a wide array of new technology uses and concepts toward the protection of our forces. *FY 2010 Plans:* Rapid reaction joint services testing support will be one week every two months at YPG. These test periods are the opportunity for technologies without enough funding for testing to show their capabilities in a real world setting. RF suppression systems will have low priority. The Joint Experimental Range Complex was constructed for the purpose of supporting these tests. Improvements and construction of a second JERC site are nearing completion. Construction of a third, mountainous JERC site is underway. A team of NAVAIR and YPG personnel is provided as manpower, expertise, facilitation, direction, and reporting. Personnel from NAVEODTech, NGIC, Marines, etc, are called upon as their expertise is required.	0.000	1.500	0.000	0.000	0.000
RRF 2010 Plans RRF investment decisions are made during the execution years in response to combatant commander, service and other government organization's requirements and as new threats emerge or new opportunities are presented. Research and coordination with organizations throughout DoD and other government agencies will help identify areas critical to developing future counterterrorism/ counterinsurgency capabilities.	0.000	25.125	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: FY10 plans include continuing to explore new and emerging capabilities to support Irregular Warfare operations. Potential areas for FY10 RRTO projects include: FOB protection, persistent surveillance, maritime awareness, interface of Law Enforcement and military ops, biometrics and forensics, autonomous operations, operations in cold environments, capabilities to exploit denied areas, strategic communications and multi-layer assessments and nontraditional approaches to leverage innovative businesses.					
RRF FY11 Goals RRF investment decisions are made during the execution years in response to combatant commander, service and other government organization's requirements and as new threats emerge or new opportunities are presented. Research and coordination with organizations throughout DoD and other government agencies will help identify areas critical to developing future counterterrorism/ counterinsurgency capabilities. *FY 2011 Base Plans:* RRTO's FY11 goals are to continue to identify and develop near term capabilities to support irregular warfare needs. RRF investment decisions are made during the execution years in response to combatant commander, service and other government organization's requirements and as new threats emerge or new opportunities are presented. Projects from these focus areas will be selected according to these needs: Small Unit, Dispersed Operations, Denied Area Operations, Autonomous System Operations, Countering and Exploiting Commercial Technologies and Commercially Derived Science and Technology Research, Military - Law Enforcement Interfaces and Coordination, Open Source Exploitation, Strategic Communications and Feedback, Standoff Facial Recognition, GMTI/SIGINT Fusion Test Bed, Sociological Sensing, Marbles, Multi-INT Track Fusion	0.000	0.000	49.422	0.000	49.422
Accomplishments/Planned Programs Subtotals	40.148	34.125	49.422	0.000	49.422

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	**PROJECT** P828: *Rapid Reaction Fund*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Augmented Reality to enhance Special Warfare Domain - "Special Warfare Domain Awareness Technologies (SW-DAT)" *FY 2009 Accomplishments:* SW-DAT provides integrated navigation (charts, sensors) and tactical (mission planning, force tracking) capability for operators of small high speed craft using unique Augmented Reality (AR) functionality. This effort has resulted in a modular bolt-on capability suitable for installation in a wide range of craft including the Special Operations Craft – Riverine (SOC-R) and the emerging Combat Craft Medium (CCM).	1.600	0.000
Congressional Adds Subtotals	1.600	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Project performance metrics are specific to each effort and include measures identified in the specific project plans. In addition, project completions and success are monitored against schedules and deliverables stated in the proposals and statements of work. The metrics include items such as target dates, production measures, fielding dates, and demonstration goals and dates. Generic performance metrics applicable to the Rapid Reaction Fund (RRF) includes attainment of DoD Strategic Objective 4-3. The title of this objective is "Speed technology transition focused on warfighting needs" and the metrics for this objective is to transition 30% of completing demonstrations program per year. During FY 2009 the RRF achieved a transition rate of greater than 90% exceeding the objective of 30%.

In FY 2011, RRF investment decisions will be made during the execution year, to rapidly respond to combatant commander requirement and new threats/new opportunities.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Office of Secretary Of Defense		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	**PROJECT** P828: *Rapid Reaction Fund*

RRF: In FY 2008/FY 2009/FY 2010 RRF investment decisions are made during the execution years in response to combatant commander requirements and new threats/new opportunities.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Office of Secretary Of Defense			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
P829: *Technology Transition Initiative (TTI)*	24.558	19.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

In FY 2011, Technology Transition Initiative (TTI), resources will be transferred from Quick Reaction Special Projects to PE 0603942D8Z (Technology Transfer and Transition) as part of an effort to more effectively align interwoven program efforts that will benefit management communications, budget justification, fiscal tracking and improve overall program resource management of Technology Transfer and Transition efforts.

A. Mission Description and Budget Item Justification

The Quick Reaction Special Projects Program (Program Element 0603826D8Z) has three sub-elements: the Technology Transition Initiative (TTI), the Quick Reaction Fund (QRF) and the Rapid Reaction Fund (RRF). The fiscal controls above represent the investment of the QRSP Program funding for the TTI Program.

The Technology Transition Initiative (TTI), authorized by Title 10 and Section 215 of the FY2003 Defense Authorization Act, facilitates the rapid transition of new technologies from the DoD science and technology (S&T) base into DoD acquisition programs. The program addresses the funding gaps that exist between the time a mature technology is demonstrated and the time it can be funded and procured for use in an intended weapons system or operational capability for the warfighter. Since the program inception in FY 2003, 75 projects have been initiated and 37 are complete. Of the 37 complete projects, 27 (73%) have successfully transitioned to DoD Acquisition Programs of Record or procurement contracts for operational use and subsequent fielding; exceeding the objective of 30% for demonstration programs Strategic Objective 4-3, Office of the Under Secretary of Defense, Acquisition, Technology & Logistics (OUSD (AT&L).

TTI projects are selected by the Technology Transition Manager (DDR&E Research Directorate) in consultation with representatives of the Technology Transition Council (TTC). (The TTC is comprised of the Acquisition and S&T executives from each Service and Defense Agency and representatives from the JROC.) The call for TTI proposals is distributed to the DoD Services and Agencies through the Technology Transition Working Group (TTWG) members, designated by the TTC. The TTWG members receive proposals from their Service/Defense Agency S&T base, conduct a prioritization based on Joint, Service or Agency capabilities needed and submit them to the OSD TTI Program Manager. The Technology Manager's senior staff consolidates the proposal submissions, evaluates the Service/ Agency recommendations, reviews new start selection options based on available resources, and prepares a recommended new start selection list to the Technology Transition Manager for funding. The Technology Transition Manager selects the highest priority proposals for funding.

The OSD FY 2010 proposal call memo was signed out by the Technology Transition Manager on February 25, 2009, requesting the Services, Agencies and CoComs provide their prioritized inputs by April 30. OSD is looking for candidate proposals that demonstrate a strong commitment from the operational and acquisition

Exhibit R-2A, RDT&E Project Justification: PB 2011 Office of Secretary Of Defense		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

communities to transition improved capabilities to operational use or an acquisition program of record. Six Core Mission Areas to define military activities required to achieve strategic objectives were established. They are: Homeland Defense and Civil Support (HD/CS), Major Combat Operations (MCOs), Military Support to Stabilization Security, Transition, and Reconstruction Operations, Deterrence Operations, Irregular Warfare, and Military Contribution to Cooperative Security. A total of 43 proposals were formally submitted to OSD, addressing these mission areas. These proposals were evaluated against the following evaluation criteria: TTI funding must accelerate product transition, the technology must be from the DoD S&T base, Component cost sharing to leverage funding, project duration less than four years, established exit criteria, potential for joint use, value to the warfighter, sufficient technology maturity, and commitment to transition/acquisition.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Implementation of Extremely Insensitive Detonating Substance (EIDS) and Insensitive Munitions Solution in 155 mm Artillery Ammunition (Army)	1.950	0.000	0.000	0.000	0.000
This effort accelerates the transition to production of technologies that eliminate or minimize accidental hazards for munitions. Insensitive Munitions (IM) minimize damage or loss of life and property due to reduction in sensitivity of the munition to external stimulus. Compliance is required by public law and mandated by DoD regulation. In addition to meeting IM requirements, the technologies will satisfy Extremely Insensitive Detonating Substances (EIDS) classification requirements for the 155mm high explosive loaded artillery projectiles being procured by the Army and United States Marine Corps (USMC). EIDS munitions dramatically enhance the warfighters' survivability by reducing the reaction to unplanned stimuli, e.g., fire, mass detonation, etc., and increase safe storage capacity of ammunitions by lowering the storage quantity / safe distance in accordance with the relaxed requirements that go with EIDS designation.					
Program Outputs and Efficiencies: EIDS classification will change the current Hazard Class from 1.1 (greatest hazard) to 1.2.3. The 1.2.3 hazard classification level allows more compact storage and shipping than otherwise, with consequent reduction of logistics costs for this widely procured Army and USMC projectile. This project will accelerate the fielding of new IM technologies from forecasted FY 2012 to FY 2009.					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Using the FY 2008 Energetic Material Qualification Board (EMQB) test matrix, all the long-term tests were scheduled for completion to qualify the new insensitive explosive formulation. The gun qualification tests were concluded. Lethality assessment was carried out by a full-scale arena test. Formal IM tests were scheduled to be performed to demonstrate compliance with current Department of Defense (DoD) IM requirements and determine the final EIDS classification. This project resulted in a Technology Readiness Level 9 (TRL 9) maturity which will be implemented by the Project Manager Combat Ammunition Systems for their applicable programs. Formal IM tests were performed to demonstrate compliance with current Department of Defense (DoD) IM requirements and determine the final EIDS classification. Energetic Material Qualification Board (EMQB) testing was completed, except for sympathetic detonation (SD). Loading parameters have been defined for transition to production. More than 37,000 pounds of IMX-101 (the explosive component of the munition) were manufactured and an additional 95,000 pounds ordered. Gun qualification tests were conducted. Lethality assessment was carried out by a full-scale arena test.					
Combined Arms Planning and Execution-monitoring System Integration into Force XXI Battle Command Brigade and Below (FBCB2) (Army) This program addresses an emerging requirement for a planning capability to reside within Force XXI Battle Command Brigade and Below (FBCB2). In Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), FBCB2 has emerged as a critical Command and Control (C2) system in both traditional and asymmetrical warfare environments. However, FBCB2 does not currently contain planning software. Both the current FBCB2 Operational Requirements Document and the draft Capabilities Development Document for the Joint Battle Command Platform (JBCP) cite requirements for decision support aids, mission planning/rehearsal, mission execution and the ability to interface with onboard/system-specific Command Control and Communication (C3) tools.	0.975	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Office of Secretary Of Defense		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Outputs and efficiencies include: The output of this program is to provide an automated planning and execution tracking capability within FBCB2. The planning capability will be derived from Combined Arms Planning and Execution-monitoring System (CAPES) and the emphasis is placed at the tactical level, allowing lower echelon commanders to provide task status reporting vertically through the Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architecture. The planning and execution tracking will provide a total situational awareness through the sharing of subordinate unit and sister unit plans. Goals/Metrics: (1) Percentage reduction in the time to develop combat plans (goal is 35 percent reduction); (2) Percentage increase in the ability to monitor execution, assess effects, and adapt (goal is 25 percent); (3) Percentage increase to track execution at allowing lower echelon commanders to provide task status, reporting vertically through the C4ISR architecture (goal is 90 percent). (4) Percentage increase in the ability to support Military Operations in Urban Terrain (MOUT) through movement planning tools that consider man-made obstacles, infrastructure and total situational awareness through the sharing of subordinate unit and sister unit plans (goal is 20 percent). This is a two year effort with the completed package delivery within FBCB2/Joint Battle Command Platform (JBCP) software baseline and installed on all platforms for SoftWare Blocking (SWB) 4 (expected to be 44,000 platforms). TTI accelerates the transition of this capability by two years. *FY 2009 Accomplishments:* Completed integration of high priority items, and selected lower priority items. Developed a new geospatial map interface to support drag and drop plan authoring and third party integration. Performed integration testing, and delivered software into the FBCB2/JBCP software baseline. Delivered the following; source code for all completed capabilities, test plan documentation, user documentation, test results and release notes, and final integrated product.					
Electronic Image Intensifier for Pilotage (Army)	2.750	2.512	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
This project will integrate Electronic Image Intensifier (EI2) technology into a lightweight sensor for the Apache Modernized-Pilot's Night Vision System (M-PNVS). Two form-fit, function and flight ready EI2 prototypes will be developed, built, and delivered to PM Apache for aircraft qualification and users evaluation flights. The EI2 camera will provide performance that is equal to or greater than the current aviator's night vision goggles and at the same time allow for image fusion with the second generation Forward Looking Infrared (FLIR) on the Apache helicopter. Program Outputs and Efficiencies: meet pilotage requirements for dynamic motion, resolution, and contrast through improved readout electronics and high definition format (1920 x 1080); exit criteria to be met include Aviator's Night Vision Imaging System (ANVIS) performance and $35 thousand per camera; two pre-production prototype cameras delivered for operational flight testing in FY 2010. TTI funding accelerates the transition of this capability by two to three years. *FY 2009 Accomplishments:* This project completed design, fabrication, and test of 1920 x 1080 Read-Out Integrated Circuit (ROIC) and camera electronics. *FY 2010 Plans:* This project will fabricate two prototypes; conduct reliability and environmental testing; initiate component qualification testing,					
Fuel Cell Powered Long Endurance Expendable Unmanned Aircraft System (Navy) The Navy and Special Forces have counterterrorism technology requirements that include an over the horizon (OTH) intelligence, surveillance and reconnaissance (ISR) capability using small unmanned aerial systems (UAS)s. Battery powered UASs, although inherently stealthy and safer to operate in most environments, lack the necessary endurance required for SOF/ISR operations and because of power and weight issues, have low grade electro-optical (EO) cameras. Currently, there is no existing UAS that can meet the needs and requirements. This technology gap prevents current SOF war	0.000	2.531	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
plans from being executed. This project will mitigate the problem by completing the development and demonstration of a small, expendable, long endurance, fuel cell powered UAS (the XFC) with a real time high resolution electro-optical/infrared (EO/IR) payload. *FY 2010 Plans:* Efforts will result in the delivery of two-four XFC UAS with a ground station and an end to end test of autonomous flight with linkages to a surfaced submarine or a land vehicle to demonstrate industry readiness by third quarter of FY 2010. Planned transition to Navy production is scheduled to start in FY 2011.					
Improved Heating Technology for the Unitized Group Ration - Express (Army) The Improved Heating Technology (IHT) project addresses a critical need for non-hydrogen producing chemical heating technology for the Unitized Group Ration Express (UGR-E) Military group self heating meal application that does not produce hydrogen as a by-product of the heating process. The primary goal of the IHT TTI project is to accelerate transition of new heater technology into an on-going UGR-E procurement that eliminates operational, transport, and storage restrictions attributed to the hydrogen by-product of the current heater and thereby fosters potential commercial applications and expanded industrial base. Additional benefits that may be realized through the IHT initiative include additional sources of supply beyond the current sole source, and improved performance, quality, and cost. Alternative ration heating technologies to be considered include an exothermic air-activated aluminum/ zinc/nickel heater, a blended phosphorous pentoxide (P205) and calcium oxide (CaO) anhydrous heater, and an enhanced Magnesium-Iron (Mg-Fe) heater that couples manganese dioxide in the heater matrix. Program Outputs and Efficiencies: 1) Raise the temperature of the shelf stable polymeric food trays from 40 to 140 degrees Fahrenheit in less than 45 minutes; 2) Weigh less than 500 grams per heater with a unit cost less than 3 dollars and pose no operational, storage, transport, or disposal restrictions;	0.676	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
3) Provide a drop-in product replacement for existing UGR-E heater product and enable an immediate transition of non-hydrogen heater technology for full rate production by Defense Supply Center Philadelphia (DSCP) in FY 2010, a three year acceleration over previous program schedules. *FY 2009 Accomplishments:* This project integrated heaters within the UGR-E assembly and tested them in an operational environment to assess reliability, durability, and user acceptance. It completed performance specifications and is scheduled to transition to DSCP for direct, rapid implementation to the target UGR-E and commercial applications.					
Joint Service General Purpose Mask Filter End-of-Service-Life Indicator (Army) An end-of-service-life indicator (ESLI) has been developed for chemical, biological radiological, nuclear (CBRN) protective mask filters that will alert the user to exchange the filter following exposure to acid-gas chemical warfare agents (CWAs). The technology to be transitioned consists of thin colorimetric indicator films coated with pondus hydrogenii (pH)sensitive dyes and reagents that target common functional groups and chemical properties of the major classes of blood agents and select Toxic Industrial Chemicals (TICs). The approach is to place the ESLI along the inside wall of the filter in contact with the carbon bed so it can react with the passing agent wave front to produce a color change, thereby alerting the user to replace the filter well before its gas-life capacity is depleted. Program Outputs and Efficiencies: The Joint Service General Purpose Mask (JSGPM) CBRN filter housing will be equipped with a transparent plastic window to view the indicator response. The ESLI will be designed to provide a visual signal when approximately 20 to 60 percent of the filter's service life capacity is expired, depending on the target agent. The ESLI technology will be transitioned to the M50 JSGPM acquisition program as a spiral upgrade (product improvement) to the current primary CBRN filter. TTI funding accelerates this transition by one year.	0.750	0.465	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

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FY 2009 Accomplishments: This project was scheduled to hold a Critical Design Review. Fabrication of ESLI filter prototypes was completed. Prototype test and evaluation was initiated. *FY 2010 Plans:* This project will complete test and evaluation, hold Transition Readiness Evaluation review, complete Engineering Change Proposal, and submit for joint service approval.					
Medium Caliber Cartridge Improvements using Micro Electro-Mechanical Systems and Direct Write Explosive Ink 40mm M433 and M430 cartridges have been in service since the 1950's and 1970's respectively, and are used with the M203 and MK-19 by all services. Both cartridges use point detonating fuzes with mechanical safe and arm devices which do not reliably detonate on soft impact targets or high graze angles. The objective of this effort is to incorporate a Micro Electro-Mechanical Systems (MEMS)-based Safe and Arm (S&A) device with automated explosive loading technology into current 40mm combat cartridges. Outputs and efficiencies: incorporate impact sensors that will sense initial impact and electronically send a signal to initiate the explosive train for improved lethality and improved reliability on soft targets (from 50 percent to 90 percent), and also significantly reduce the number of duds on the battlefield and training ranges. The MEMS S&A will also require less volume which will allow room for improvements in lethality or other future alternate applications. This Technology Transition Initiative accelerates transition of this technology by approximately three years. *FY 2009 Accomplishments:* This project built inert demonstration units verifying MEMS survivability of MK19 cycling/firing and conducted a laboratory safety evaluation on micro-scale firetrain.	1.200	3.865	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: This project will initiate verification hardware build and conduct test and evaluation on prototype high explosive cartridges.					
Tactically Integrated Sensor (TIS) (Navy) The Tactically Integrated Sensor project provides the ability to protect the last miles of the Sea Lanes of Communication. The specific objectives of the project are to support US Forces in an area of heightened vulnerability from surface, air and subsurface attack; protect merchant shipping and maritime infrastructure; and quickly assess the extent of the threat for the Naval Coastal Warfare (NCW) Commander. Output of the project will provide an integrated family of surface, air and subsurface sensors for persistent intelligence, surveillance and reconnaissance which is fundamental to the NCW mission *FY 2009 Accomplishments:* This project built two software spirals to process, correlate and de-conflict multiple and dissimilar sensor type data, and present data as a consolidated combat system picture. It integrated small high speed surface vessel detection and tracking into the combat system. It also integrated additional capabilities to detect and track swimmer/diver delivery vehicles, and provided capability to the combat system to detect and track aircraft.	2.400	0.000	0.000	0.000	0.000
Solid State Laser Ignition (Army) The Solid State Laser Ignition System replaces the primer feed mechanism (PFM) and primers used in the 155 mm M777 family of towed howitzers. The current PFM ignition system is complex and high maintenance with known operational issues due to mechanical jamming of the PFM and premature firing due to primer sensitivity. This solid state laser ignition system increases system safety by eliminating the manufacture, storage, resupply and demilitarization of explosive primers and reduces	1.200	0.515	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
system costs associated with the logistics and maintenance required with primers and primer feed mechanisms. Outputs and efficiencies: (1) an integrated design for M777 application where major risk areas have been mitigated or managed; (2) hardware availability to verify the design in system tests; and (3) a comprehensive assessment of the technology to support a production decision and an operational evaluation of its readiness for field insertion. This solid state laser ignition effort will yield a system prototype and will accelerate the availability of this technology for fielding by four years. *FY 2009 Accomplishments:* The system requirements review (SRR) was conducted, the preliminary design was completed and the preliminary design review (PDR) was conducted. Detail design was performed, and an integration concept was developed from system trades which focused on minimizing the operational impact of converting from a primer based to a solid state laser ignition system on the current M777 family of towed howitzers. Test articles were fabricated and qualified by subsystem tests. Hazard analyses and safety assessments were performed in preparation of system test and live fire evaluation. *FY 2010 Plans:* Risk mitigation activities will be completed and a post PDR assessment (PPA) will be conducted. Prototype hardware will be fabricated, the advanced system demonstrator (ASD) test readiness review (TRR) will be conducted and ASD testing and evaluation will be completed in accordance with the diode pumped laser ignition system (DPLIS) Program test schedule. Improvements to the prototype hardware design will be incorporated and captured in the solid state laser ignition Technical Data Package (TDP). Hardware will be procured and fabricated for conducting development testing (DT) and early user assessment (EUA) by the program office in accordance with the DPLIS Program test schedule. Manufacturing and technology readiness assessments will be performed.					
Tactical Idle Reduction Equipment for Heavy Tactical Vehicles (Army)	1.950	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
This project develops and equips a suitable auxiliary power unit (APU) and auxiliary environmental control unit onto the next-generation M915 and family of next-generation long haul Heavy Tactical Vehicles (HTV's). Excessive fuel consumption for this fleet of vehicles has been attributed to significant idling, during which the vehicle is parked but the main engine is left running to meet power and energy demands. The idle reduction equipment developed under this effort would enable M915 operators to disable the main engine while maintaining power and environmental control capabilities, thereby conserving 66 percent of the fuel currently being consumed by the fleet during parked operations. Outputs and efficiencies: 1) Fabrication of an APU and integration onto the M915 platform; 2) Demonstration of power quality utility class 2C conformance per Department of Defense Military-Standard-1332B, protective device functionality verification, and validated environmental control per American Society of Heating Refrigerating and Air-Conditioning Standard 37. Additionally, operational testing of integrated idle reduction equipment will be performed to demonstrate that it can be integrated with the M915 to fit its maintenance and operational schedule without any adverse effects. These tests include demonstration of maintenance ratio less than 0.015, demonstrated reliability comparable to the M915 (mean time between hardware mission failure of 8,600 miles), and conformance to survivability metrics for shock, vibration, sand, water-immersion, hot/cold environmental, altitude testing. TTI funding accelerates the transition of this capability three years. *FY 2009 Accomplishments:* Accomplished test and evaluation on stand-alone auxiliary power unit (APU) and auxiliary environmental control unit prototypes. Integrated prototypes onto M915 platform and performed advanced technology demonstration and maintenance demonstration of fully-integrated platform for Program Manager (PM) HTV.					
Weapons Decision Support System (Navy)	0.690	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Weapons Decision Support System (WDSS) provides intelligent agent decision support to provide the Build Breakout Re-stow Management Tool (BBRMT) Ready Service Weapons (RSW) breakout and build planning, Magazine Arrangement Planning Aid - Internet (MAPA-I) planning, and ADMACS integration onboard carriers. WDSS system manages weapons current stowage location, weapons peculiar attributes, breakout and build support requirements, and alternate weapons availability. WDSS employs expert systems and intelligent agents to collect, interpret, and process the information into a knowledge base which can be used to support and automate the decision making processes associated with weapons planning. WDSS will function as a component of Aviation Weapons Information Management System (AWIMS) that will interface with or receive data from other systems such as Load Plan Generator, Ordnance Information System (OIS), MAPA-I, and other related systems to provide weapon system attributes during planning of the aircraft load plan. Outputs and efficiencies: WDSS shortens the time to plan initial ship load-outs and fulfill replenishment requisitions by 50 percent and improves availability of weapons asset availability information following replenishment by 30 percent. WDSS increases survivability; less bombs are required to be staged on flight deck (stage only two events in advance vice three-five events in advance). Higher mission-capable sortie rate, additional 18-25 sorties from faster planning, mission flexibility and tracking under WDSS. TTI funding accelerates the transition of this capability by two years. *FY 2009 Accomplishments:* Accomplished System and Software requirements identification. Initiated steps to incorporate WDSS into ADMACS Block 2 for shipboard testing and fleet delivery.					
Battlespace Terrain and Reasoning Awareness Battle Command (BTRA-BC) (Army) BTRA-BC transitions terrain, atmospheric and weather analytic Tactical Decision Aids (TDAs) in support of Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR). TDA software for transition operates at two levels: 1) TDAs that operate over	1.200	0.000	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
large data sets to create actionable information of the effects of the terrain, atmosphere and weather on units, tactics, ground and air platforms, systems and sensors and the soldier and 2) TDAs that perform mission and task level analysis in support of the Military Decision Making Process (MDMP), planning, Course of Action Analysis (COA), asset management and execution monitoring. Specific TDAs developing actionable information address topics of: 1) Observation and Fields of Fire, Cover and electro-optical concealment, Obstacles, Key Terrain and Avenues of Approach, 2) platform mobility and unit maneuver incorporating weather effects, 3) interactive graphs representing maneuver potential and battlefield geometry, 4) Tactical Spatial Objects for varying military tasks, 5) Infra-red, Acoustic and Seismic sensor performance, 6) atmospheric and weather effects on UAV mobility and performance. TDAs addressing MDMP activities support: 1) Interactive, MapQuest-like mission constrained ground and air platform routing, 2) ISR asset management, 3) ground and air asset synchronization and 4) battlefield effects. All products are designed for visualization and input to other automated Battlefield Operating Systems (BOSs). BTRA-BC transitions an Engineered Doctrinal Knowledge (EK) language supporting semantic and syntactic interoperability between Army and Joint systems via the Joint Consultation, Command and Control Information Exchange Data Model (JC3IEDM) required by Army and USMC systems. Each year, BTRA-BC will transition various data analysis and decision support tools to: 1) National Geospatial-Intelligence Agency's (NGA) Commercial Joint Mapping Toolkit (CJMTK), supporting 207 approved Joint Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) programs, 2) the Digital Topographic Support System (DTSS) supporting the Current force of the Army at Division and Brigade Combat Teams via CJMTK, 3) Distributed Common Ground System Army via CJMTK and 4) the Army's Future Combat System via CJMTK. Efficiencies: 1) Software reuse: Transition via NGA's Commercial Joint Mapping Toolkit (CJMTK) and make the software tools available to over 207 approved Joint C4ISR programs and operational					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

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on military systems using either Windows, Solaris (Unix) or Linux operating systems. 2) Common integration and use of tools and products. CJMTK will provide, for the first time, reference implementation guidance regarding software, services and resulting product interaction using the JC3IEDM. 3) Single approach to interoperability across Joint and Coalition Systems for geospatial Battle Command Information. 4) Early risk mitigation. Accelerated transition allows the Army's Future Combat System and Distributed Common Ground System-Army (DCGS-A) and Digital Topographic Support System (DTSS) to evaluate and adopt design methods, procedures and processes in early spirals of development. TTI accelerates the delivery of these tools by one year. *FY 2009 Accomplishments:* Transitioned six (6) decision support tools, aggregated services and data/ information models for incorporation in the Army mandated Joint C3 Information Exchange Data Model (JC3IEDM). Outcomes: (1) Common, Joint Battle Command software tools and services ensuring consistent, actionable information from terrain and weather analysis, enabling shared awareness, empowering predictive analysis and providing a common geo-environmental basis to the Common Operating Picture (COP) or Common Relevant Operating Picture (CROP); (2) Extended capability to share actionable, C4ISR relevant, geospatial and weather information with Army and Coalition partners via the extension of the Joint C3 Information Exchange Data Model (JC3IEDM); and (3) Defense Information Service Agency (DISA) compliant analytic software services.					
Precision Fires Image Software Suite Handheld Capability (Navy) Currently Overseas Contingency Operations (OCO) missions on the ground are planned using traditional means and require dismounted operators, (conventional and Special Operations Forces), who do not carry laptop computers. The mission set is currently supported by paper (maps, printouts of images, etc.). The objective of this project is to integrate Battlespace Awareness (Mission Planning, Force Protection, Direct Action, etc.) capability on a Windows CE/mobile handheld computer by building	1.300	1.420	0.000	0.000	0.000

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
upon already proven and deployed technology. The availability of these software tools on a handheld computer will immediately advance warfighter capabilities by enhancing situational awareness, precision targeting, and rapid employment at the tactical level. Program Outputs and Efficiencies: This program will generate and transition a Government-Off-The-Shelf (GOTS) software suite that provides image, video, and geographical capabilities on the Army's Pocket Sized Forward Entry Devices (PFED) and compatible Special Operations Forces Windows mobile handheld computers. These forward operating Battlespace Awareness applications will be built around the previously transitioned and deployed Precision Fires Image (PFI), which is a National Geospatial-Intelligence Agency (NGA) validated, CENTCOM approved, image-based targeting tool for coordinate-seeking weapons. Integration to the handheld computer will be advantageous in achieving advanced mission capability with less weight, space, and provide shorter operational readiness delays. The TTI funding will accelerate the acquisition and integration of this handheld software capability by two to three years. *FY 2009 Accomplishments:* The first year focused on: 1) Gridded Reference Graphics (GRG's), Collateral Damage Estimation (CDE); 2) Importing route capability; and 3) Inclusion of the Combatant Commander's No Strike List. This provided: 1) The capability to use Windows XP/Vista computers to generate PFI's from any image (i.e. commercial satellite, Global Hawk, national systems) that has the meta-data required to support coordinates so that missions can be run using a variety of images; 2) basic graphics and drawing capability to any 3rd party application by generation of a generic shared object module on the CE/ Mobile devices; and 3) the ability to work directly with dismounted users (Special Operations and Conventional Forces) during a series of events and before deployment to inject advanced capability and Tactics Techniques and Procedures (TTP's) designed to save lives and successfully prosecute Overseas Contingency Operations (OCO) missions. Technology was transitioned on a six-month cycle with enhancements integrated into the PFED baseline based on blocking cycles and integrate with an initial Program of Instruction (POI) at each Service's schoolhouse.					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

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FY 2010 Plans: The second year will focus on Battlespace Awareness directed at specific mission sets, which include Direct Action (DA), Leadership Interdiction Operations (LIO), Mobility and Force Protection (FP). Integration with other imagery types will be accomplished as well as integration with the Rapid Delivery of Online Geospatial Intelligence (GEOINT) (RDOG) program to provide current imagery directly to the warfighter. A "low visibility" or "Red night mode" as required by the operators will be produced. Product upgrades will deployed on six month transition upgrade cycles, testing capability with scheduled exercises, and working with the instructors and schoolhouses.					
Magneto-Rheological (MR) Fluid Suspension System for Stryker (Army)	2.900	1.335	0.000	0.000	0.000
The objective of the project is the direct replacement of the Stryker Family of Vehicles (FOV) passive suspension system with the Magneto-Rheological (MR) Fluid Semiactive Suspension System during the Stryker Modernization Program (S-MOD). The MR Suspension System significantly reduces shock and vibration levels, improves vehicle mobility and handling, and improves chassis stability, thereby improving crew responsiveness during target acquisition and engagement as well as improving firing accuracy for the Mobile Gun System (MGS). The TTI effort will accelerate the integration activity to the Stryker fleet by 8-12 months. Program Outputs and Efficiencies: The MR Suspension technology is low risk and will provide outstanding vehicle performance, including cross-country speed improvements up to 72 percent, vehicle hull shock and vibration reductions up to 60 percent, a 30 percent improvement in vehicle handling stability, and greater than 50 percent improvement in firing accuracy. The MR suspension improvement in ride performance will also reduce operator fatigue, thereby increasing crew sustainment and operational effectiveness.					

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603826D8Z: *Quick Reactions Special Projects (QRSP)*	PROJECT P829: *Technology Transition Initiative (TTI)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Completed Tank-Automotive and Armaments Command (TACOM) Life Cycle Management Command (LCMC) assessments, test plans, and reports, procured contracts, solicited cost estimates and test plans from government testing facilities and generated reports of each of the following testing phases. 1) Design Iteration and analysis: augmented the Wheeled Vehicle Power and Mobility Advanced Technology Objective - Development (ATO-D) for system/subsystem design iterations and analysis. 2) Subcomponent Endurance Testing: performed design iterations of the current damper hardware and developed subcomponents of the newly iterated design using the predetermined Stryker Mission Profile provided by the Program Management Office for the Stryker Brigade Combat Team (PMO SBCT). 3) Component Endurance and Environmental Testing: performed endurance testing of the newly iterated MR damper design using the predetermined Stryker Mission Profile provided by PMO SBCT at both ambient temperature and also in a cold chamber to determine the durability of the system. 4) Full Vehicle Endurance Simulation Testing: developed and installed a full vehicle set of MR dampers for a Stryker vehicle, which were provided by PMO SBCT, for the purpose of endurance testing the vehicle *FY 2010 Plans:* Vehicle Baseline Characterization at Yuma Proving Grounds (YPG): generate data for the purpose of replicating and comparing to the MR Suspension Endurance Test on the 8-post shaker at the Tank Automotive Research, Development and Engineering Center (TARDEC).					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Full Vehicle Endurance Simulation Testing at TARDEC: simulate 3000 miles of the most strenuous courses from the program manager approved Mobile Gun System (GGS) Reliability Availability and Maintainability (RAM) Mission Profile Test. Full Vehicle Endurance Testing at YPG: 3000 miles of the most strenuous courses from the PM SBCT approved MGS RAM Mission Profile Test S-MOD Vehicle Demonstration: S-MOD vehicle demonstration will take place at Aberdeen Proving Grounds. The Suspension Trade Study decision is based on the performance of the system during this vehicle demonstration.					
Polymer Light Emitting Diode (PLED) Identification of Friend or Foe (IFF) (USSOCOM) United States Special Operations Command users currently lack adequate, mutually recognizable, and intuitive IFF systems that are accepted and interpreted across the command. An improved IFF system is required to mitigate potential friendly fire incidents within Special Operations Forces (SOF). The objective of this project is implementation of a next generation IFF system incorporating PLED technology for laser interrogated response visible only to Generation III Night Vision Goggles (NVGs). This Technology Transition Initiative (TTI) will accelerate the program by 12-18 months. In addition to programmatic acceleration, TTI funding will enable acceleration in manufacturing and production of PLED emitters. Program Outputs and Efficiencies: The program will deliver significantly enhanced IFF capability providing an IFF emitter visible to GEN III NVGs operating in the near-infrared (IR) spectrum and initiated only by modulated military laser interrogators (AN/PEQ-5). The effort will focus on developing brighter PLED material with extended emission range, improving efficiency of the system through integration of flat-cell batteries, and development of a streamlined, flexible form-factor that meets user requirements.	0.900	0.375	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: The project: 1) delivered Spiral 1 PLED IFF Tag prototypes (100 units); 2) completed Limited User Assessment of the Spiral 1 prototypes; and 3) drafted an IFF Annex to the Special Operations Personal Equipment Advanced Requirements (SPEAR) Operational Requirement Document (ORD). *FY 2010 Plans:* This project will develop and produce 200 Spiral 2 Prototype IFF PLED Tags based on user defined modifications generated during the FY 2009 user evaluation and requirements development process and conduct an Operational Test to support a procurement decision and potential initial operating capability (IOC) in 2010.					
155mm M1122 (formerly M107E1) IM Training Projectile (Army) The objective of this program is to provide artillerymen with a safer, combat-representative, less expensive, 155mm training round that would be Insensitive Munitions (IM) compliant. This new training round will be used in lieu of the 155mm M107 high explosive (HE) wartime projectile and provides the look, feel and flight characteristics of the wartime M795 HE projectile. The plan includes reutilization of M483 shell bodies (from the M483 demilitarized (DEMIL) effort driven by End-of-Life and Cluster Munition Elimination policy issues) and utilizes the IMX-101 Extremely Insensitive Detonating Substance (EIDS) explosive formulation (a non-TNT formulation leveraged under an ongoing FY2008 TTI project) to produce the M1122 projectile. TTI funding accelerates the transition of this capability by one year. Program Outputs and Efficiencies: 1) Enhances IM performance; 2) Reduces training costs; 3) Improves logistics safety; 4) Enhances training by more closely replicating the operational capability; and 5) Improves soldier safety during training.	2.065	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: In FY09 this project baselined the final design and performed qualification testing to support a Milestone C Type Classification and loaded and tested the projectiles according to Hazard Classification testing requirements given in TB700-2 (the IM requirements in MIL STD 2105C).					
Improved Tactical Air Launched Decoy – Jamming (ITALD-J) Project (Navy) This project will transition a compact payload for a new variant of ITALD using component designs developed under ONR Future Naval Capabilities program funding. Additional information is For Official Use Only (FOUO). Program Outputs and Efficiencies: This project will integrate and transition a new payload into the currently fielded ITALD. Four form-fit systems and firmware will be delivered. *FY 2009 Accomplishments:* Vehicle and avionics modifications were completed and repackaged together. *FY 2010 Plans:* Complete environmental and flight testing and deliver the prototypes to the program of record.	0.802	0.990	0.000	0.000	0.000
Hellfire Height of Burst (HOB) Sensor (Army) The Hellfire Height of Burst Sensor is a miniaturized radio frequency (RF) or laser based target detection device that will be integrated into the new Electronic Safe and Arm Device (ESAD) being incorporated into the next generation Hellfire missile (Hellfire R). The HOB sensor provides for improved lethality against targets in the open by detonating the warhead at a height above ground optimized for these targets. This TTI project funds the final design and engineering of the HOB sensor optimized for Hellfire, provides component and system level environmental and hardware-in-the-loop	0.500	2.665	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
testing, and allows two flight tests of HOB sensor equipped missiles. TTI funding accelerates the delivery of this capability by two years. Program Outputs and Efficiencies: HOB sensor for the Hellfire AGM-114R missile. The HOB sensor will be integrated into the Hellfire missile and undergo hardware-in-the-loop, environmental, and flight testing as part of the TTI effort. The final outcome will be two missile flights incorporating the HOB sensor. The first flight will replace the warhead with a telemetry package to record the missile flight data as well as the point at which the HOB sensor triggers the warhead. The second flight will incorporate both the HOB sensor and the Hellfire warhead. Lethality data will be collected to validate the modeled performance against targets in the open. Simulation has shown that the HOB sensor will significantly increase the lethality when fired from platforms that allow a steep angle of impact. TTI accelerates the transition of this capability by two years. *FY 2009 Accomplishments:* The requirements for the HOB sensor were finalized. Modifications to the Hellfire arming device were initiated. *FY 2010 Plans:* Performance testing of the HOB sensors as well as hardware-in-the-loop and environmental testing and two flight tests are scheduled for FY 2010.					
Hellfire II Next Generation Captive Carry Health Monitor (NG-CCHM) (Army) The Hellfire II NG-CCHM is a missile health monitoring device that measures and records operational and environmental stresses tailored to the most recent Hellfire II missile design, the AGM-114R model. The NG-CCHM is conceiHOB ved as a self-powered, low-cost autonomous system capable of measuring and recording key health status parameters. It will be an electronic data acquisition device embedded into each missile and will be optimized for long life to automatically record Captive Carry hours, temperature exposure,	0.350	2.535	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
and possibly humidity exposure and drop shock events. The NG-CCHM will enable the warfighter to ascertain if a missile has been subjected to excessive use or exceeded environmental design parameters that may prevent the missile from performing according to specifications. Program Outputs and Efficiencies: System requirements trade study, preliminary design review, critical design review, design verification and analysis activities. This effort will leverage past and ongoing Army Aviation and Missile Research Development and Engineering Center (AMRDEC) Science & Technology (S&T) efforts, specifically the Remote Readiness Asset Prognostics and Diagnostics System (RRAPDS). Initiated as a Science and Technology Objective (STO) in FY00-02 timeframe, RRAPDS is a missile health monitoring system that senses and measures the environments to which a missile has been exposed inside its storage container. Key technologies of this system are integrated into Patriot, Precision Attack Missile, and Ground Multiple Launch Rocket System. An applied research effort titled "Missile Sustainment Technology" that began in FY07 will be leveraged. The primary efficiencies expected from the NG-CCHM effort are reduced Operations and Maintenance (O&M) costs and maintenance burden to the warfighter, increased reliability and availability, and enhanced system safety; the residual from these efficiencies is increased readiness. TTI funding accelerates the delivery of this capability by two years. *FY 2009 Accomplishments:* The system requirements trade study was completed. *FY 2010 Plans:* Based on the trade study completed in FY 2009, the selection of sensors to be used in the monitoring device is underway. Preliminary design review, critical design review, and design verification and analysis activities are scheduled for FY 2010. The effort will provide form-factored prototypes to support completion of design verification testing. The formal qualification efforts associated with the AGM-114R health monitoring unit will begin in FY 2011.					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals	24.558	19.208	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Project performance metrics are specific to each effort and include measures identified in the project plans identified above as well . In addition, program completion and success will be monitored against program schedule and deliverable stated in the proposals. The metrics include items such as target dates from project work break down schedules, production measures, production goals, production numbers and demonstration goals and dates. Generic performance metrics applicable to the Technology Transition Initiative (TTI) program includes attainment of Strategic Objective 4-3, Office of the Under Secretary of Defense, Acquisition, Technology & Logistics (OUSD (AT&L)). The title of this objective is "Speed technology transition focused on warfighting needs" and the metrics for this objective and the objective of TTI is to transition 30% of completing demonstrations program per year.

FY 2009 Performance: The Technology Transition Initiative demonstrated a transition rate of 66% and exceeded the 30% goal identified in Strategic Objective 4-3.

In FY 2009, initiated the new start of 5 projects and concluded the activities on continuing projects with the result of 6 technologies transitioning to the warfighter.

FY 2010 Goal: Initiate the new start of 5 projects and conclude the activities on continuing projects with the result of at least 16 technologies transitioning to the warfighter.