Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Air Force										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*				R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	66.972	33.414	39.738	-	39.738	41.699	43.450	42.495	43.194	Continuing	Continuing
632100: *Laser Hardened Materials*	23.611	19.853	23.019	-	23.019	22.337	23.821	25.176	25.590	Continuing	Continuing
633153: *Non-Destructive Inspection Development*	4.000	2.260	5.144	-	5.144	7.384	7.453	5.350	5.439	Continuing	Continuing
633946: *Materials Transition*	28.278	9.039	9.218	-	9.218	9.096	9.174	9.447	9.601	Continuing	Continuing
634918: *Deployed Air Base Demonstrations*	11.083	2.262	2.357	-	2.357	2.882	3.002	2.522	2.564	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program develops and demonstrates materials technology for transition into Air Force systems. The program has five projects which develop: (1) hardened materials technologies for the protection of aircrews and sensors; (2) non-destructive inspection and evaluation technologies; (3) transition data on structural and non-structural materials for aerospace applications; (4) airbase operations technologies including deployable base infrastructure, force protection, and fire fighting capabilities; and (5) advanced materials for space applications. Efforts in the program have been coordinated through the Reliance 21 process to harmonize efforts and eliminate duplication. This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing system upgrades and/or new system developments that have military utility and address warfighter needs.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	67.856	33.414	40.341	-	40.341
Current President's Budget	66.972	33.414	39.738	-	39.738
Total Adjustments	-0.884	-	-0.603	-	-0.603
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.885	-			
• Other Adjustments	0.001	-	-0.603	-	-0.603

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Project: 633153: *Non-Destructive Inspection Development*		
Congressional Add: *Aircraft Evaluation Readiness Initiative (AERI)*	2.390	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Air Force	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603112F: *Advanced Materials for Weapon Systems*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Congressional Add Subtotals for Project: 633153	2.390	-
Project: 633946: *Materials Transition*		
Congressional Add: *Metals Affordability Initiative*	9.958	-
Congressional Add: *EMI Grid Fabrication Technology*	2.390	-
Congressional Add: *Silicon Carbide Electronics Material Producibility Initiative*	5.019	-
Congressional Add: *SiC-RF Power for Avionics Systems*	1.593	-
Congressional Add Subtotals for Project: 633946	18.960	-
Project: 634918: *Deployed Air Base Demonstrations*		
Congressional Add: *Body Armor Improved Ballistic Protection*	1.753	-
Congressional Add: *Strategic Biofuels Supply System*	1.593	-
Congressional Add: *Sewage-Derived Biofuels Program*	3.824	-
Congressional Add: *Military Waste-to-Energy Project Using the Hydro-Thermal Energy Conversion (Hy-TEC) Process*	1.593	-
Congressional Add Subtotals for Project: 634918	8.763	-
Congressional Add Totals for all Projects	30.113	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 632100: *Laser Hardened Materials*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
632100: *Laser Hardened Materials*	23.611	19.853	23.019	-	23.019	22.337	23.821	25.176	25.590	Continuing	Continuing

Note

Note: Beginning in FY 2011, funds from Project 2100 are moved to Program Element 0602102F Project 4348 to increase emphasis on applied research.

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced materials technologies that enhance protection for Air Force aircrews to ensure safety and to enable aircrews to perform required missions in threat environments. Advanced materials technologies are also developed and demonstrated to enhance protection for Air Force sensor systems to ensure safety, survivability, and operability in threat environments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 1	19.542	16.792	18.929	-	18.929
Description: Develop and demonstrate materials technologies that enhance hardening for sensors, avionics, and components to increase survivability and mission effectiveness of aerospace systems. ***FY 2010 Accomplishments:*** Investigated performance of dual band limiter materials in tactical systems. Demonstrated protection strategies for large format multi-chip Charge Coupled Devices (CCDs). Fabricated and demonstrated solid state limiter and filter technology for protection of space systems. Evaluated materials survivability for space environments. Analyzed the effect of laser energy on optical materials and electro-optical sensors and space structural materials. ***FY 2011 Plans:*** Evaluate hardening performance of current materials and technologies to threats. Demonstrate detector hardening for next generation United States Air Force targeting platforms. Develop new persistent surveillance detectors with increased survivability. Design more robust Visible/Near Infrared (Vis/NIR) detectors. Incorporate materials in optical test bed configuration and test performance in relevant environments. Demonstrate optimized nonlinear optical limiter materials for damage protection. Demonstrate semiconductor optical limiter materials performance for damage protection. Verify performance of hardening Short Wavelength Infrared (SWIR) sensor systems. Evaluate materials survivability for relevant environments. Develop advanced thin film concepts for enhanced fixed filter performance. ***FY 2012 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 632100: *Laser Hardened Materials*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Continue to evaluate and prioritize advanced rugate coatings and liquid crystal materials technologies as protection against laser and directed energy threats aimed at sensors and avionics. Transition most mature coatings and liquid crystal hardening technologies for next generation targeting platforms. Initiate demonstrations of promising and viable coating and liquid crystal technologies into next generation of persistent surveillance sensor designs as well as demonstrating strategies to mitigate directed energy damage for visible/near infrared (Vis/NIR) detectors and Short Wave Infrared (SWIR) detectors that are critical for intelligence, surveillance, and reconnaissance (ISR) sensors. Continue testing of damage limiting semiconductor materials in test bed configuration to determine viability for protection of tactical and strategic space sensors and for short wave infrared systems. Assess vulnerability of current seekers/munitions against emerging countermeasure threats. Develop and demonstrate personnel protection technologies - including tailored rugate coatings and liquid crystal materials technologies specific for visor applications -against visible and SWIR directed energy laser threats. ***FY 2012 OCO Plans:***					
Title: Major Thrust 2 ***Description:*** Develop and demonstrate materials technologies that enhance protection for Air Force aircrews to ensure safety and to enable aircrew to perform required missions in a threat environment. ***FY 2010 Accomplishments:*** Integrated fixed optical coatings within visor applications for demonstration. ***FY 2011 Plans:*** Investigate susceptibility of candidate detectors for Head Mounted Display (HMD) systems. Demonstrate enhanced photorefractive hybrid materials concepts for Air Force passive protection applications. Identify personnel protection technologies for the visible and SWIR. Evaluate performance of optical coatings within visor applications. ***FY 2012 Base Plans:*** Develop and demonstrate personnel protection technologies for the visible and SWIR. Continue to evaluate performance and initiate process development of optical coatings within visor applications. ***FY 2012 OCO Plans:***	4.069	3.061	4.090	-	4.090
Accomplishments/Planned Programs Subtotals	23.611	19.853	23.019	-	23.019

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 632100: *Laser Hardened Materials*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• Activity Not Provided: *Title Not Provided*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Not Applicable.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 633153: *Non-Destructive Inspection Development*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
633153: *Non-Destructive Inspection Development*	4.000	2.260	5.144	-	5.144	7.384	7.453	5.350	5.439	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced nondestructive inspection/evaluation (NDI/E) technologies to monitor performance integrity and to detect failure causing conditions in weapon systems components and materials. NDI/E capabilities greatly influence and/or limit many design, manufacturing, and maintenance practices. This project provides technology to satisfy Air Force requirements to extend the lifetime of current systems through increased reliability and cost-effectiveness at field and depot maintenance levels. Equally important is assuring manufacturing quality, integrity, and safety requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 1 ***Description:*** Develop and demonstrate advanced technologies to improve capabilities to inspect for cracks and other damage to extend the total safe life of turbine engines. ***FY 2010 Accomplishments:*** Validated NDI/E approaches to extend the life of fracture-critical gas turbine engine components. ***FY 2011 Plans:*** Transition NDI/E approaches to extend the life of fracture-critical gas turbine engine components. ***FY 2012 Base Plans:*** Investigate NDI/E approaches to measure material properties to extend the life and increase durability of fracture-critical gas turbine engine components. ***FY 2012 OCO Plans:***	0.195	0.650	1.378	-	1.378
Title: Major Thrust 2 ***Description:*** Develop and demonstrate advanced inspection technologies supporting low-observable (LO) systems to enhance affordability and ensure full performance and survivability. ***FY 2010 Accomplishments:*** Transitioned a common, multiuse, multiplatform, handheld LO NDI/E point inspection tool/sensor system. ***FY 2011 Plans:***	0.761	0.351	0.421	-	0.421

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 633153: *Non-Destructive Inspection Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Develop inspection methods and sensor technology for signature and material integrity of next generation LO material systems. ***FY 2012 Base Plans:*** Advance inspection methods and sensor technology for signature and material integrity of next generation LO material systems. ***FY 2012 OCO Plans:***					
Title: Major Thrust 3 ***Description:*** Develop and demonstrate advanced systems status monitoring technologies to provide on-board and embedded sensing to gain continuous awareness of the state of key subsystems. ***FY 2010 Accomplishments:*** Developed and demonstrated optimal sensing approaches for real-time health monitoring of high-temperature protection and advanced material systems and characterize power scavenging and signal transmission issues. Validated smart sensor technologies for wiring health analysis. Validated field and depot-level inspection tools for assessing the stuctural health of airframes. ***FY 2011 Plans:*** Demonstrate optimal sensing approaches for real-time health monitoring of high-temperature protection and advanced material systems and characterize power scavenging and signal transmission issues. Transition smart sensor technologies for wiring health analysis. Transition field and depot-level inspection tools for assessing the structural health of airframes. ***FY 2012 Base Plans:*** Continue to transition smart sensor technologies for wiring health analysis. Continue to transition field and depot-level inspection tools for assessing the structural health of airframes. ***FY 2012 OCO Plans:***	0.654	1.259	3.345	-	3.345
Accomplishments/Planned Programs Subtotals	1.610	2.260	5.144	-	5.144

	FY 2010	FY 2011
Congressional Add: Aircraft Evaluation Readiness Initiative (AERI)	2.390	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603112F: *Advanced Materials for Weapon Systems*	**PROJECT** 633153: *Non-Destructive Inspection Development*

	FY 2010	FY 2011
FY 2010 Accomplishments: Conduct Congressionally-directed effort.		
FY 2011 Plans:		
Congressional Adds Subtotals	2.390	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• Activity Not Provided: *Title Not Provided*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Not Applicable.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 633946: *Materials Transition*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
633946: *Materials Transition*	28.278	9.039	9.218	-	9.218	9.096	9.174	9.447	9.601	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced materials and processing technologies for fielded and planned Air Force weapon, airframe, and propulsion applications. Advanced materials and processes that have matured beyond applied research are characterized, critical data are collected, and critical evaluations in the proposed operating environment are performed. These design and scale-up data improve the overall affordability of promising materials and processing technologies, providing needed initial incentives for their industrial development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 1	3.066	4.254	4.168	-	4.168
Description: Develop and demonstrate Materials and Processes (M&P) technologies for air vehicle and subsystems to enhance lift, propulsion, low-observable performance, power generation management, and affordability of air vehicles. ***FY 2010 Accomplishments:*** Refined processes for producing large area, high-quality diamond windows for airborne high power microwave directed energy weapons. Initially developed nanostructured materials using multiple approaches for high energy density capacitors for pulsed power applications. Transitioned and validate the methodology to characterize LO materials during production for process control and process validation. ***FY 2011 Plans:*** Develop and transition production-level capable processes for producing large area, high-quality diamond windows for airborne high power microwave directed energy weapons. Demonstrate and compare advantages of approaches for high energy density capacitors for pulsed power applications. Initiate validation of processing methods and lifing tools for hybrid disk concepts. Initiate validation of processing methods and lifing methodologies for advanced (Silicon Carbide) SiC/SiC composites. Develop and demonstrate methodology for process control and validation of next generation Low Observable (LO) material systems. ***FY 2012 Base Plans:*** Demonstrate high rate production-capable processes for producing large area, high quality diamond windows for airborne high power microwave directed energy weapons. Develop materials enabling critical components for next-generation airborne high energy lasers that are solid-state, electrically-powered, and significantly					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 633946: *Materials Transition*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
higher efficiency. Advance validation of processing methods and lifing tools for graded microstructure turbine engine disk concepts. Advance validation of processing methods and lifing methodologies for advanced high temperature SiC/SiC-based composites. Develop and validate next generation NDE/I sensor systems for advanced LO material systems. ***FY 2012 OCO Plans:***					
Title: Major Thrust 2 ***Description:*** Develop and demonstrate M&P technologies to enhance the sustainability of aerospace systems by lowering Operations and Maintenence (O&M) costs to ensure the full operability and safety of systems and personnel. ***FY 2010 Accomplishments:*** Demonstrated innovative technologies for bare base utilities. Developed new design and manufacturing processes to achieve dramatic reductions in nonrecurring fabrication and assembly tooling costs and schedules for composite and metallic aircraft utilizing bonded structures and friction stir welding. ***FY 2011 Plans:*** Demonstrate and transition innovative technologies for bare base utilities. ***FY 2012 Base Plans:*** Demonstrate and transition innovative technologies for bare base utilities. ***FY 2012 OCO Plans:***	4.299	0.711	0.750	-	0.750
Title: Major Thrust 3 ***Description:*** Develop and demonstrate affordable, novel high temperature materials/structures and thermal management concepts to enable future defense capabilities for prompt global strike concepts. ***FY 2010 Accomplishments:*** Identified key issues and structural concepts for hot structure and thermal protection systems to be fabricated from advanced ceramics, ceramic matrix composites, hybrids, and advanced metals and intermetallics. ***FY 2011 Plans:***	1.953	4.074	4.300	-	4.300

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 633946: *Materials Transition*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Explore fabrication techniques for hot structure and thermal protection systems from advanced ceramics, ceramic matrix composites, hybrids and advanced metals and intermetallics. ***FY 2012 Base Plans:*** Advance multi-material structure to optimally address operational temperature zones for hot structure and thermal protection systems from advanced ceramics, ceramic matrix composites, hybrids and advanced metals and intermetallics. ***FY 2012 OCO Plans:***					
Accomplishments/Planned Programs Subtotals	9.318	9.039	9.218	-	9.218

	FY 2010	FY 2011
Congressional Add: Metals Affordability Initiative ***FY 2010 Accomplishments:*** Conduct Congressionally-directed effort. ***FY 2011 Plans:***	9.958	-
Congressional Add: EMI Grid Fabrication Technology ***FY 2010 Accomplishments:*** Conduct Congressionally-directed effort. ***FY 2011 Plans:***	2.390	-
Congressional Add: Silicon Carbide Electronics Material Producibility Initiative ***FY 2010 Accomplishments:*** Conduct Congressionally-directed effort. ***FY 2011 Plans:***	5.019	-
Congressional Add: SiC-RF Power for Avionics Systems ***FY 2010 Accomplishments:*** Conduct Congressionally-directed effort. ***FY 2011 Plans:***	1.593	-
Congressional Adds Subtotals	18.960	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 633946: *Materials Transition*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• Activity Not Provided: *Title Not Provided*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Not Applicable.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 634918: *Deployed Air Base Demonstrations*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
634918: *Deployed Air Base Demonstrations*	11.083	2.262	2.357	-	2.357	2.882	3.002	2.522	2.564	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced, rapidly deployable airbase technologies that enable agile combat support by reducing airbase manpower requirements, reducing airbase setup times and improving the protection and survivability of deployed Air Force Expeditionary (AFE) warfighters. Affordable, efficient technologies are developed and demonstrated to provide deployable infrastructure, weapon system support, blast and munition force protection and firefighting capability for deployed AEF operations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 1	1.130	1.074	1.098	-	1.098
Description: Demonstrate and transition deployable infrastructure airbase technologies, to reduce airlift and manpower requirements, setup time, and sustainment costs in support of AEF operations. ***FY 2010 Accomplishments:*** Demonstrated and transitioned methods for integrated, advanced power generation and distribution. Demonstrated methods and technologies for performing aircraft operating surface evaluations for ability to sustain aircraft operations. Demonstrated and analyzed rapid temporary and permanent high temperature operating surface repairs. ***FY 2011 Plans:*** Continue to demonstrate and transition integrated, advanced power generation and distribution methods. Demonstrate methods and technologies to evaluate operating surfaces for ability to sustain remote and autonomous aircraft operations. Demonstrate and optimize rapid temporary and permanent high temperature operating surface repairs. ***FY 2012 Base Plans:*** Characterize, demonstrate and fabricate airbase alternative energy generation, power grid conditioning and distribution methods. Characterize and develop best practices for aircraft operating surface evaluation and repair technologies. Characterize, fabricate and demonstrate aircraft operating surface high operating temperature materials and technologies. ***FY 2012 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603112F: *Advanced Materials for Weapon Systems*	**PROJECT** 634918: *Deployed Air Base Demonstrations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 2	1.190	1.188	1.259	-	1.259
Description: Demonstrate and transition technologies to provide force protection and fire fighting capability for deployed AEF operations. ***FY 2010 Accomplishments:*** Demonstrated agile and lightweight adaptive blast suppression materials in representative structures. Integrated and demonstrated candidate fire fighter safety technologies against representative environments and threats. Integrated and demonstrated candidate ultrahigh pressure nozzles, and other technologies in fire safety systems. Demonstrated air filtration and reactive filtration effectiveness for expeditionary structures and personnel protection. ***FY 2011 Plans:*** Demonstrate and transition agile, lightweight adaptive blast suppression materials in representative structures. Demonstrate and optimize candidate fire fighter safety technologies against representative environments and threats. Demonstrate and transition candidate ultrahigh pressure nozzles, and other technologies in fire safety systems. Develop and demonstrate reactive and responsive materials for platforms, expeditionary structures and personnel protection. ***FY 2012 Base Plans:*** Characterize and maintain competency for fabrication and demonstration of technologies for airbase structural protection against blast and fragmentation. Characterize and develop technologies for airbase firefighting and composite materials combustion. ***FY 2012 OCO Plans:***					
Accomplishments/Planned Programs Subtotals	2.320	2.262	2.357	-	2.357

	FY 2010	FY 2011
Congressional Add: Body Armor Improved Ballistic Protection	1.753	-
FY 2010 Accomplishments: Conduct Congressionally-directed effort.		
FY 2011 Plans:		
Congressional Add: Strategic Biofuels Supply System	1.593	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603112F: *Advanced Materials for Weapon Systems*	PROJECT 634918: *Deployed Air Base Demonstrations*

	FY 2010	FY 2011
FY 2010 Accomplishments: Conduct Congressionally-directed effort. ***FY 2011 Plans:***		
Congressional Add: Sewage-Derived Biofuels Program ***FY 2010 Accomplishments:*** Conduct Congressionally-directed effort. ***FY 2011 Plans:***	3.824	-
Congressional Add: Military Waste-to-Energy Project Using the Hydro-Thermal Energy Conversion (Hy-TEC) Process ***FY 2010 Accomplishments:*** Conduct Congressionally-directed effort. ***FY 2011 Plans:***	1.593	-
Congressional Adds Subtotals	8.763	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• Activity Not Provided: *Title Not Provided*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Not Applicable.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.