RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE: February 2003

BUDGET ACTIVITY: 03 - Advanced Technology Development (ATD)

PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems

	COST ($ in Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	42,310	41,159	33,079	34,374	39,922	46,613	41,409	41,990	Continuing	TBD
2100	Laser Hardened Materials	20,978	13,774	15,457	22,610	28,004	35,527	30,152	30,574	Continuing	TBD
3153	Non-Destructive Inspection Development	6,299	8,359	5,742	4,080	4,114	4,187	4,251	4,311	Continuing	TBD
3946	Materials Transition	13,784	15,174	9,981	5,312	5,412	4,465	4,535	4,599	Continuing	TBD
4918	Deployed Air Base Demonstrations	1,249	3,852	1,899	2,372	2,392	2,434	2,471	2,506	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: In FY 2002, Project 4918, Deployed Air Base Demonstration, efforts were transferred from PE 0603205F, Project 4398, and PE 0603112F, Project 3946. In FY 2003, the space unique tasks in Projects 2100 and 3946 were transferred to PE 0603500F, Project 5032, Advanced Space Materials, as a result of the Space Commission recommendation to consolidate all space unique activities.

(U) A. Mission Description

This program develops and demonstrates materials technology for transition into Air Force systems. The program has four projects which develop: (1) laser hardened materials technologies for the broadband laser protection of aircrews and sensors; (2) non-destructive inspection and evaluation technologies; (3) transition data on structural and non-structural materials for aerospace applications; and (4) airbase operations technologies including power generators, deployable shelters, and fire fighting capabilities. Note: In FY 2003, Congress added $1.7 million for an advanced laser program for plasma enhanced chemical vapor deposition techniques for laser protection coatings, $2.5 million for quantitative inspection techniques for assessing aging of military aircraft, $1.4 million for assessing aging of military aircraft, $1.1 million for handheld holographic radar gun, $4.0 million for powdered programmable process, $3.5 million for ceramic matrix composites for engines, $1.4 million for low bandwidth medical collaboration, $1.2 million for hybrid bearing, $1.1 million for vapor grown carbon fiber, $1.0 million for advanced material corrosion research for liquid metal alloys, and $1.8 million for Tyndall Air Force Research Laboratory, which explains the perceived decrease in FY 2004.

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(U) B. Budget Activity Justification

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.

(U) C. Program Change Summary ($ in Thousands)

		FY 2002	FY 2003	FY 2004	Total Cost
(U)	Previous President's Budget	45,801	21,138	41,486	
(U)	Appropriated Value	46,248	41,838		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-447	-442		
	b. Small Business Innovative Research	-1,138			
	c. Omnibus or Other Above Threshold Reprogram		-237		
	d. Below Threshold Reprogram	-2,146			
	e. Rescissions	-207			
(U)	Adjustments to Budget Years Since FY 2003 PBR			-8,407	
(U)	Current Budget Submit/FY 2004 PBR	42,310	41,159	33,079	TBD

(U) Significant Program Changes:

In FY 2003, the space unique tasks in Projects 2100 and 3946 were transferred to PE 0603500F, Project 5032, as a result of the Space Commission recommendation to consolidate all space unique activities. This explains the perceived decrease in FY 2003. The decreases since the FY 2003 PBR are the result of realignment due to higher Air Force priorities. In addition, in FY 2003, this program received Congressional Adds, which explains the overall decrease in FY 2004.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)

DATE: February 2003

BUDGET ACTIVITY: 03 - Advanced Technology Development (ATD)

PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems

PROJECT: 2100

COST ($ in Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
2100 Laser Hardened Materials	20,978	13,774	15,457	22,610	28,004	35,527	30,152	30,574	Continuing	TBD

Note: In FY 2003, space unique tasks in Project 2100 were transferred to PE 0603500F, Project 5032, as a result of the Space Commission recommendation to consolidate all space unique activities.

(U) A. Mission Description

Develops enabling materials and concepts for protecting Air Force assets such as aircrews, munitions, and aerospace sensors against laser and high-power microwave directed energy threats. Concepts are demonstrated to provide hardening options for transition to Air Force systems. The goal is to ensure mission capability before, during, and after threat exposure. Current protection schemes are activated by intensity or wavelength and are only capable of countering a specific portion of the laser threat. Recent laser technology developments have increased laser wavelength agility. To harden systems against all potential lasers, the development of a combination of approaches is required. Note: In FY 2003, Congress added $1.7 million for advanced laser program for plasma enhanced chemical vapor deposition techniques for laser protection coatings, which explains the perceived decrease in FY 2004.

(U) FY 2002 ($ in Thousands)

(U) $0 Accomplishments/Planned Program

(U) $5,059 Developed and demonstrated advanced materials technologies that enhance laser hardening of Air Force spacecraft sensors to ensure safety, survivability, and operability in a laser threat environment. Designed and fabricated optical limiters for the protection of mid-wave infrared staring focal plane arrays. Tested and updated the hardened coating process for rugate fixed-wavelength filters and optical switches for mid-wave infared space systems. Fabricated hardening solutions for critical space sensor designs and environments based on successful approaches employed in tactical sensors.

(U) $8,011 Developed and demonstrated advanced materials technologies that enhance laser hardening for Air Force aircrews to ensure safety and to enable aircrews to perform required missions in a laser threat environment. Fabricated and validated flexible filter technology (rugate and enhanced thin films) in prescription capable spectacles. Demonstrated first generation tristimulus filter technology (enhanced thin films combined with absorbing dyes) for daytime missions. Completed and transitioned both flexible filters and tristimulus filters in wraparound spectacles for human factors evaluations. Demonstrated laser protective fixed filters for the panaromic night vision goggle (PNVG) program. Began development of tunable liquid-crystal filter technology for the PNVG program.

(U) $7,908 Developed and demonstrated advanced materials technologies that enhance laser hardening for sensors, avionics, and components to increase survivability and mission effectiveness of areospace systems. Developed damage resistant image intensifier tubes. Developed laser damage resistant image intensifiers, charge couple devices, and architectures for fielded television targeting systems. Evaluated laser hardening materials

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BUDGET ACTIVITY 03 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603112F Advanced Materials for Weapon Systems	PROJECT 2100

(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

for mid-wave infrared targeting systems and precision-guided munitions.

(U) $20,978 Total

(U) FY 2003 ($ in Thousands)

(U) $0 Accomplishments/Planned Program

(U) $7,698 Develop and demonstrate advanced materials technologies that enhance laser protection for Air Force aircrews to ensure safety and to enable aircrews to perform required missions in a laser threat environment. Transition flexible filter technology in the form of spectacles for human factors evaluations and design refinement. Transition first generation tristimulus filter technology for daytime missions to the Life Support Systems Program Office. Fabricate refined tristimulus filter eyewear based on results from human factors study. Transition fixed wavelength filter technology to the panoramic night vision goggle (PNVG) program for flight tests. Continue the development of tunable filter technology for PNVGs. Identify and evaluate hardening technologies for use in protecting eyes from agile laser threats.

(U) $6,076 Develop and demonstrate advanced materials technologies that enhance laser hardening for sensors, avionics, and components to increase survivability and mission effectiveness of aerospace systems. Demonstrate complete hardening for a fielded electro-optical sensor system. Develop hardening solutions for Charge Coupled Device (CCD) imaging systems. Initiate hardening development for multispectral and hyperspectral sensor systems.

(U) $13,774 Total

(U) FY 2004 ($ in Thousands)

(U) $0 Accomplishments/Planned Program

(U) $11,030 Develop and demonstrate advanced materials technologies that enhance laser protection for Air Force aircrews to ensure safety and to enable aircrews to perform required missions in a laser threat environment. Identify next generation technology advancements to improve performance of tristimulus filter technology. Characterize tunable filter technology in a representative PNVG prototype system. Develop optical limiter devices to protect eyes from agile laser threats.

(U) $4,427 Develop and demonstrate advanced materials technologies that enhance laser hardening for sensors, avionics, and components to increase survivability and mission effectiveness of aerospace systems. Demonstrate image intensifier tube hardening. Develop hardening solutions for replacement sensors selected for the electro-optical sensor system. Evaluate hardening solutions for CCD imaging systems.

(U) $15,457 Total

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BUDGET ACTIVITY: 03 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems — PROJECT: 2100

(U) B. Project Change Summary

Not Applicable.

(U) C. Other Program Funding Summary ($ in Thousands)

(U) Related Activities:
(U) PE 0602102F, Materials.
(U) PE 0602202F, Human Effectiveness Applied Research.
(U) PE 0603231F, Crew Systems and Personnel Protection Technology.
(U) PE 0603500F, Multi-Disciplinary Advanced Development Space Technology.
(U) PE 0604706F, Life Support Systems.
(U) Coordinated through the Tri-Service Laser Hardening Materials and Structures Working Group and the Joint Service Agile Laser Eye Protection Program.
(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.

(U) D. Acquisition Strategy

Not Applicable.

(U) E. Schedule Profile

(U) Not Applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)

DATE: February 2003

BUDGET ACTIVITY: 03 - Advanced Technology Development (ATD)

PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems

PROJECT: 3153

COST ($ in Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
3153	Non-Destructive Inspection Development	6,299	8,359	5,742	4,080	4,114	4,187	4,251	4,311	Continuing	TBD

(U) A. Mission Description

Develops and demonstrates advanced Non-Destructive 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. Reduction in the number of fighter wings and the need for rapid sortie generation demand an ability to perform real-time NDI/E more rapidly than is currently possible. 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. Note: In FY 2003, Congress added $2.5 million for quantitative inspection techniques for assessing aging of military aircraft, $1.4 million for assessing aging of military aircraft, and $1.1 million for handheld holographic radar gun, which explains the perceived decrease in FY 2004 and out.

(U) FY 2002 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program
(U)	$3,099	Developed and demonstrated advanced technologies for improved capabilities in materials corrosion, fatigue monitoring, and testing of aging aircraft to reduce operations and maintenance costs. These technologies will guarantee full operability and safety of the aircraft fleet. Developed and demonstrated advanced technologies for improved capabilities in detection and characterization of corrosion in aging aircraft while emphasing improvement in the probability of detecting serviceable cracks. Developed advanced methods to detect cracks in multiple layers to meet aging aircraft life extension requirements.
(U)	$1,321	Developed and demonstrated advanced technologies for improved capabilities to assess high cycle fatigue and engine life prediction practices to extend the total safe life of turbine engines. Transitioned Non-Destructive Evaluation (NDE) benchmarks and continued development of an automated inspection capability for engine rotary components for increased rotor life extension. Investigated candidate NDE techniques to extend the life of fracture-critical gas turbine engine components and to develop techniques for subsurface component evaluations. Developed an advanced X-ray robotic brassboard to measure surface residual stress on full-scale turbine engine components.
(U)	$1,879	Developed and demonstrated advanced inspection technologies supporting low-observable (LO) systems to enhance affordability and to ensure full performance and survivability. Demonstrated an advanced multispectral LO NDE tool for assessing radio frequency signature (zone versus whole aircraft) that is real-time, lightweight, portable, user friendly, and covers multiple frequency bands. Completed and transitioned to the field an advanced hand-held directional reflectometer for field level infrared signature NDE.
(U)	$6,299	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2003
BUDGET ACTIVITY 03 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603112F Advanced Materials for Weapon Systems
PROJECT 3153	

(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program
(U)	$2,501	Develop and demonstrate advanced technologies for improved capabilities in materials corrosion, fatigue monitoring, and testing of aging aircraft to reduce operations and maintenance costs. These technologies will guarantee full operability and safety of the aircraft fleet. Develop and demonstrate advanced technologies for improved capabilities in detection and characterization of corrosion of joints in aging aircraft. Develop and demonstrate advanced methods to detect cracks in multiple layers in order to meet aging aircraft life extension requirements.
(U)	$3,851	Develop and demonstrate advanced technologies for improved capabilities to assess high cycle fatigue and engine life prediction practices to extend the total safe life of turbine engines. Continue transition of Non-Destructive Evaluation (NDE) benchmarks. Test an automated inspection capability that will inspect engine rotary components for planned life extension of engine rotors. Downselect optimal NDE approaches to extend the life of fracture-critical gas turbine engine components and establish protocols for component inspections. Develop residual stress gradient measurement technologies to increase measurement on shot peened surfaces.
(U)	$2,007	Develop and demonstrate advanced inspection technologies supporting low-observable systems to enhance affordability and ensure full performance and survivability. Transition to the field an advanced multispectral low-observable NDE tool for assessing radio frequency signature (zone versus whole aircraft) that is real-time, small, lightweight, portable, user friendly, and covers multiple frequency bands.
(U)	$8,359	Total

(U) FY 2004 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program
(U)	$1,747	Develop and demonstrate advanced technologies for improved capabilities in materials corrosion, fatigue monitoring, and testing of aging aircraft to reduce operations and maintenance costs. These technologies will guarantee full operability and safety of the aircraft fleet. Demonstrate and validate pulsed eddy current automated scanner technology for improved capabilities in detection and characterization of corrosion of joints in aging aircraft. Validate low-frequency electromagnetic probe methods to detect cracks in multiple layers in order to meet aging aircraft life extension requirements.
(U)	$2,020	Develop and demonstrate advanced technologies for improved capabilities to assess high cycle fatigue and engine life prediction practices to extend the total safe life of turbine engines. Fabricate and demonstrate an automated inspection capability for engine rotary components for planned life extension of engine rotors. Characterize optimal NDE approaches to extend the life of fracture-critical gas turbine engine components and establish protocols for component inspections.
(U)	$1,975	Develop and demonstrate advanced systems health monitoring technologies to provide on-board and embedded sensing to gain continuous awareness of the state of key subsystems. Develop optimal approaches and methodologies to address the continuous monitoring of materials

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BUDGET ACTIVITY: 03 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems — PROJECT: 3153

(U) A. Mission Description Continued

(U) FY 2004 ($ in Thousands) Continued

integrity and status for critical elements of structures/airframes, propulsion systems, thermal protection, tankage, and wiring.

(U) $5,742 Total

(U) B. Project Change Summary

Not Applicable.

(U) C. Other Program Funding Summary ($ in Thousands)

(U) Related Activities:

(U) PE 0602102F, Materials.

(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.

(U) D. Acquisition Strategy

Not Applicable.

(U) E. Schedule Profile

(U) Not Applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)

DATE: February 2003

BUDGET ACTIVITY: 03 - Advanced Technology Development (ATD)

PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems

PROJECT: 3946

COST ($ in Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
3946 Materials Transition	13,784	15,174	9,981	5,312	5,412	4,465	4,535	4,599	Continuing	TBD

Note: In FY 2002, the Deployed Air Base Demonstration efforts in this PE were transferred from Project 3946 to Project 4918. In FY 2003, space unique tasks in Project 3946 were transferred to PE 0603500F, Project 5032, as a result of the Space Commission recommendation to consolidate all space unique activities.

(U) A. Mission Description

Develops and demonstrates advanced materials and processing technologies for fielded and planned Air Force weapon, airframe, and engine 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. This design and scale-up data enhances overall affordability of promising materials and processing technologies, providing needed initial incentives for their industrial development. Note: In FY 2003, Congress added $4.0 million for powdered programmable process, $3.5 million for ceramic matrix composites for engines, $1.4 million for low bandwidth medical collaboration, $1.2 million for hybrid bearing, $1.1 million for vapor grown carbon fiber, and $1.0 million for advanced material corrosion research for liquid metal alloys, which explains the perceived decrease in FY 2004.

(U) FY 2002 ($ in Thousands)

(U) $0 Accomplishments/Planned Program

(U) $8,147 Developed and demonstrated advanced materials and processing technologies for air vehicles and subsystems to enhance the lift, propulsion, low-observable performance, and overall affordability of air vehicles. Fabricated and characterized integrated composite structure assemblies for aircraft with reduced part count and assembly costs. Completed demonstration of advanced aircraft brake materials with improved braking capacity, increased life, and better environmental stability. Characterized advanced non-linear optical materials for aircraft infrared countermeasures against far-infrared laser sources.

(U) $1,525 Developed and demonstrated advanced materials and processing technologies for space vehicles and subsystems to provide enhanced surveillance capabilities, improved access to space, and improved overall affordability of space vehicles. Characterized improved material processes with increased yields for robust, high performance, and producible infrared detector materials. Continued efforts to validate and demonstrate materials and materials processing technologies to improve performance, reliability, and affordability of spacecraft components and subsystems. Characterized effects of space exposure on advanced material systems.

(U) $4,112 Developed and demonstrated advanced materials and processing technologies to enhance the sustainability of Air Force aerospace systems by lowering operations and maintenance costs while ensuring the full operability and safety of systems and personnel. Completed the characterization of a large-aperture Aluminum Oxynitride window material with high optical quality, durability, and strength. Evaluated the effectiveness of corrosion abatement treatments and transitioned the results.

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

(U)	$13,784	Total

(U) FY 2003 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program
(U)	$12,005	Develop and demonstrate advanced materials and processing technologies for air vehicles and subsystems to enhance the lift, propulsion, low-observable performance, and overall affordability of air vehicles. Continue to fabricate and characterize integrated composite structure assemblies for aircraft with reduced part count and assembly costs. Complete the demonstration of advanced non-linear optical materials for aircraft infrared countermeasures against far-infrared laser sources and then transition results. Conduct characterization of materials and processes for enhancing the reliability and maintainability of low-observable systems. Accelerate the development of advanced bearing materials for gas turbine engines.
(U)	$3,169	Develop and demonstrate advanced materials and processing technologies to enhance the sustainability of Air Force aerospace systems by lowering operations and maintenance costs and ensuring the full operability and safety of systems and personnel. Initiate efforts to develop and characterize corrosion resistant coatings and corrosion prevention compounds for aging aircraft structures applications.
(U)	$15,174	Total

(U) FY 2004 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program
(U)	$8,268	Develop and demonstrate advanced materials and processing technologies for air vehicles and subsystems to enhance the lift, propulsion, low-observable performance, and overall affordability of air vehicles. Demonstrate improved materials and inspection tools/processes to enhance reliability and maintainability of low-observable platforms. Demonstrate fabrication processes and properties of ceramic composite materials for turbine engine exhaust components. Develop an affordable high-temperature composite process that enables the fabrication of turbine engine components for future air vehicles to meet cost and performance criteria. Identify materials and their properties for a mid-infrared laser source enabling aircraft infrared countermeasures. Develop, demonstrate, and evaluate materials and processes for high-speed lift and aerospace vehicles. Evaluate characterization techniques and critical data for processing and fabrication of thermal protection components, high temperature structural elements, and fuel systems. Develop and assess metallic, ceramic, and carbon-based composite materials and processing technologies for application to ramjet, scramjet, cryogenic, and combined-cycle engines and structures.
(U)	$1,713	Develop and demonstrate advanced materials and processing technologies to enhance the sustainability of Air Force aerospace systems by lowering operations and maintenance costs and ensuring full operability and safety of systems and personnel. Evaluate corrosion resistant coatings and corrosion prevention compounds for aging aircraft structures applications. Initiate effort to determine durability and failure

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PROJECT 3946	

(U) A. Mission Description Continued

(U) FY 2004 ($ in Thousands) Continued

mechanisms of hybrid structures in Unmanned Air Vehicles.

(U) $9,981 Total

(U) B. Project Change Summary

Not Applicable.

(U) C. Other Program Funding Summary ($ in Thousands)

(U) Related Activities:

(U) PE 0602102F, Materials.

(U) PE 0603211F, Aerospace Technology Dev/Demo.

(U) PE 0603202F, Aerospace Propulsion Subsystems Integration.

(U) PE 0603203F, Advanced Aerospace Sensors.

(U) PE 0603500F, Multi-Disciplinary Advanced Development Space Technology.

(U) PE 0603216F, Aerospace Propulsion and Power Technology.

(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.

(U) D. Acquisition Strategy

Not Applicable.

(U) E. Schedule Profile

(U) Not Applicable.

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PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems

PROJECT: 4918

COST ($ in Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
4918	Deployed Air Base Demonstrations	1,249	3,852	1,899	2,372	2,392	2,434	2,471	2,506	Continuing	TBD

Note: In FY 2003, Project 4918, Deployed Air Base Demonstration, efforts were transferred from PE 0603205F, Project 4398, and PE 0603112F, Project 3946.

(U) A. Mission Description

Supports the Aerospace Expeditionary Forces (AEF) through development and demonstration of advanced, rapidly deployable airbase technologies that reduce airlift and manpower requirements, setup times, and sustainment costs. Develops and demonstrates efficient and cost-effective technologies to provide physical protection and fire fighting for deployed AEF warfighters and infrastructure. Develops and demonstrates affordable rapidly deployed technologies that ensure military readiness, support advanced weapon systems, and enable enhanced peacetime training operations. Note: In FY 2003, Congress added $1.8 million for Tyndall Air Force Research Laboratory, which explains the perceived decrease in FY 2004.

(U) FY 2002 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program
(U)	$501	Demonstrated and transitioned advanced rapid deployment airbase technologies that reduce airlift, setup times, manpower requirements, and sustainment costs in support of AEF technologies. Developed deployable shelters/heat pump, power, and rapid airfield assessment technologies that improve air mobile systems performance and reduce airlift requirements in support of AEF. Developed advanced aircraft fire fighting agents and equipment. Demonstrated highly effective, deployable crash/rescue technologies based on three-dimensional foam technology to support AEF operations.
(U)	$101	Demonstrated and transitioned affordable, rapid deployment technologies that ensure military readiness, maintain aerospace missions, support advanced weapon systems, and enable peacetime training operations. Developed advanced waste reactor technologies to support deployed waste management systems. Developed a full-scale design for a rapidly deployable mixed-base hydrogen peroxide production plant for airborne laser operations.
(U)	$647	Demonstrated and transitioned efficient and cost-effective technologies to provide physical protection technologies to AEF deployed warfighters and infrastructure. Developed deployable protective and reactive blast suppression technologies to protect deployed warfighters. Developed autonomous ground vehicles to support Air Force operational requirements for unexploded ordnance clearance and active range operations.
(U)	$1,249	Total

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(U) A. Mission Description Continued

(U)	FY 2003 ($ in Thousands)	
(U)	$0	Accomplishments/Planned Program
(U)	$2,259	Demonstrate and transition advanced rapid deployment airbase technologies that reduce airlift and manpower requirements, setup times, and sustainment costs in support of Aerospace Expeditionary Force (AEF) operations. Continue development of shelters, power, and rapid airfield assessment technologies that improve system performance and reduce airlift requirements in support of AEF operations. Develop advanced aircraft fire fighting technologies such as fire fighting agents and equipment. Transition a highly effective, deployable crash/rescue system based on three-dimensional foam technology to support AEF operations.
(U)	$101	Demonstrate and transition affordable, rapid deployment technologies that ensure military readiness, maintain aerospace missions, support advanced weapon systems, and enable peacetime training operations. Continue development of advanced waste reactor technologies to support emerging weapons. Demonstrate rapidly deployable full-scale mixed-base hydrogen peroxide production plant that reduces the airborne laser logistics burdens by thirty percent.
(U)	$1,492	Demonstrate and transition efficient and cost-effective technologies to provide physical protection to deployed AEF warfighters and infrastructure. Develop deployable protective and advanced blast suppression technologies to protect deployed warfighters. Continue development of autonomous vehicles to support Air Force operational requirements for unexploded ordnance clearance and active range operations.
(U)	$3,852	Total
(U)	FY 2004 ($ in Thousands)	
(U)	$0	Accomplishments/Planned Program
(U)	$1,776	Demonstrate and transition advanced, rapidly deployable airbase technologies that reduce airlift and manpower requirements, setup time, and sustainment costs in support of AEF operations. Transition air-inflatable shelter technology to support logistics footprint reduction in AEF operations. Demonstrate 10KW fuel cell power system that improves deployable power system performance and reduces airlift requirements for AEF operations. Demonstrate rapid airfield assessment technologies that improve performance and enhance AEF operations support. Identify and integrate advanced shelter technologies to increase energy efficiency and provide protection against chemical, biological, and directed energy weapons.
(U)	$123	Demonstrate and transition efficient and cost-effective technologies to provide physical protection to deployed AEF warfighters and infrastructure. Demonstrate deployable protective and advanced blast suppression technologies to protect deployed warfighters. Continue development of autonomous vehicles to support Air Force operational requirements for unexploded ordnance clearance and active range operations.

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(U) A. Mission Description Continued

(U) FY 2004 ($ in Thousands) Continued
(U) $1,899 Total

(U) B. Project Change Summary

Not Applicable.

(U) C. Other Program Funding Summary ($ in Thousands)

(U) Related Activities:
(U) PE 0602102F, Materials.
(U) PE 0604617F, Agile Combat Support.
(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.

(U) D. Acquisition Strategy

Not Applicable.

(U) E. Schedule Profile

(U) Not Applicable.