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

DATE: February 2002

BUDGET ACTIVITY: 03 - Advanced Technology Development

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

| | COST ($ in Thousands) | FY 2001 Actual | FY 2002 Estimate | FY 2003 Estimate | FY 2004 Estimate | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total Program Element (PE) Cost | 41,815 | 45,801 | 21,138 | 41,486 | 42,684 | 41,255 | 42,195 | Continuing | TBD |
| 2100 | Laser Hardened Materials | 10,022 | 23,251 | 12,359 | 30,473 | 30,534 | 28,815 | 30,596 | Continuing | TBD |
| 3153 | Non-Destructive Inspection Development | 10,099 | 6,692 | 3,488 | 3,819 | 4,153 | 4,233 | 4,313 | Continuing | TBD |
| 3946 | Materials Transition | 21,694 | 14,458 | 3,173 | 5,256 | 5,582 | 5,746 | 4,779 | Continuing | TBD |
| 4918 | Deployed Air Base Demonstrations | 0 | 1,400 | 2,118 | 1,938 | 2,415 | 2,461 | 2,507 | Continuing | TBD |
| | Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: In FY 2002, the deployed air base demonstration efforts in PE 0603205F, Project 4398, and PE 0603112F, Project 3946, are transferred into this PE in Project 4918. In FY 2003, only the space unique tasks in Projects 2100 and 3946 will be transferred to PE 0603500F, Project 5032, in conjunction with 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: (1) develop laser hardened materials technologies for the broadband laser protection of aircrews and sensors; (2) develop non-destructive inspection and evaluation technologies; (3) develop transition data on structural and non-structural materials for aerospace applications; and, (4) develop airbase operations technologies including power generators, deployable shelters, and fire fighting capabilities. Note: In FY 2002, Congress added $1.1 million for Metals Affordability Initiative, $3.4 million for advanced aluminum aerostructures, $2.8 million for ceramic matrix composites for engines, $2.1 million for technology development investment for aging aircraft, $2.1 million for plasma enhanced chemical deposition techniques, $1.0 million for vapor growth carbon fiber (VGCF), and $1.0 million for handheld holographic radar gun which explains the perceived decrease in FY 2003.

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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 2001 | FY 2002 | FY 2003 | Total Cost |
|---|---|---|---|---|---|
| (U) | Previous President's Budget | 43,575 | 32,748 | 25,734 | |
| (U) | Appropriated Value | 43,978 | 46,248 | | |
| (U) | Adjustments to Appropriated Value | | | | |
| | a. Congressional/General Reductions | | -447 | | |
| | b. Small Business Innovative Research | -1,032 | | | |
| | c. Omnibus or Other Above Threshold Reprogram | | | | |
| | d. Below Threshold Reprogram | -728 | | | |
| | e. Rescissions | -403 | | | |
| (U) | Adjustments to Budget Years Since FY 2002 PBR | | | -4,596 | |
| (U) | Current Budget Submit/FY 2003 PBR | 41,815 | 45,801 | 21,138 | TBD |

Significant Program Changes:

(U) Significant Program Changes:

In FY 2003, only the space unique tasks in Projects 2100 and 3946 will be transferred to PE 0603500F, Project 5032, in conjunction with the Space Commission recommendation to consolidate all space unique activities. Additionally, in FY 2002, this program received Congressional Adds which explains the perceived decrease in FY 2003.

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

DATE: February 2002

BUDGET ACTIVITY: 03 - Advanced Technology Development

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

PROJECT: 2100

| COST ($ in Thousands) | FY 2001 Actual | FY 2002 Estimate | FY 2003 Estimate | FY 2004 Estimate | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 2100 Laser Hardened Materials | 10,022 | 23,251 | 12,359 | 30,473 | 30,534 | 28,815 | 30,596 | Continuing | TBD |

Note: In FY 2003, space unique tasks in Project 2100 will be transferred to PE 0603500F, Project 5032, in conjunction with 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 development has increased laser wavelength agility. To harden systems against all potential lasers the development of a combination of approaches is required.

(U) FY 2001 ($ in Thousands)

(U) $1,448 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. Fabricated and characterized hybrid optical limiters for the protection of staring focal plane arrays. Fabricated rugate fixed-wavelength filters and optical switches for mid-wave infrared (MWIR) space systems. Developed hardening solutions for critical space sensor designs and environments based on successful approaches employed in tactical sensors.

(U) $5,077 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. Developed fixed filters and invisible laser eye protection visor for panoramic night vision goggles (PNVG). Evaluated tunable filter PNVG protection technology. Validated wrap-around tristimulus spectacles (eye-glasses). Developed prescription capable flexible filter for eye protection. Transitioned prescription-capable, eye-centered rugates on lenses with dyed plastic substrates.

(U) $3,497 Developed and demonstrated advanced materials technologies that enhance laser hardening for sensors, avionics, and components to increase survivability and mission effectiveness of air vehicles systems. Fabricated high performance rugate filters for hardened low light level television systems. Initiated development of specific hardening techniques for specific munitions. Developed specific hardening techniques for MWIR and long-wave infrared staring forward looking infrared systems.

(U) $10,022 Total

| RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) | DATE: February 2002 |
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| BUDGET ACTIVITY: 03 - Advanced Technology Development | PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems / PROJECT: 2100 |

**(U) A. Mission Description Continued**

(U) FY 2002 ($ in Thousands)

(U) $5,636 Develop and demonstrate advanced materials technologies that enhance laser hardening of Air Force spacecraft sensors to ensure safety, survivability, and operability in a laser threat environment. Design and fabricate optical limiters for the protection of mid-wave infrared staring focal plane arrays. Test and update hardened coating process for rugate fixed-wavelength filters and optical switches for mid-wave infared space systems. Fabricate hardening solutions for critical space sensor desings and environments based on successful approaches employed in tactical sensors.

(U) $9,046 Develop and demonstrate 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. Fabricate and validate flexible filter technology (rugate and enhanced thin films) in prescription capable spectacles. Demonstrate first generation tristimulus filter technology (enhanced thin films combined with absorbing dyes) for daytime missions. Complete and transition both flexible filters and tristimulus filters in wraparound spectacles for human factors evaluations. Demonstrate laser protective fixed filters for the panaromic night vision night goggle (PNVG) program. Begin development of tunable liquid crystal filter technology for the PNVG program.

(U) $8,569 Develop and demonstrate advanced materials technologies that enhance laser hardening for sensors, avionics and components to increase survivability and mission effectiveness of areospace systems. Develop damage resistant image intensifier tubes. Develop laser damage resistant image intensifiers, charge couple devices, and architectures for fielded television targeting systems. Evaluate laser hardening materials for mid-wave infrared targeting systems and precision-guided munitions.

(U) $23,251 Total

(U) FY 2003 ($ in Thousands)

(U) $6,148 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 evaluation 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 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) $6,211 Develop and demonstrate advanced materials technologies that enhance laser hardening for sensors, avionics, and components to increase survivability and mission effectiveness of areospace systems. Demonstrate complete hardening for a fielded TV sensor system. Develop hardening solutions for Charge Coupled Device imaging systems. Initiate hardening development for multispectral and hyperspectral sensor

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| BUDGET ACTIVITY: 03 - Advanced Technology Development | PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems / PROJECT: 2100 |

**(U) A. Mission Description Continued**

(U) FY 2003 ($ in Thousands) Continued

systems.

(U) $12,359 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 0602202F, Human Effectiveness Applied Research.
(U) PE 0603231F, Crew Systems and Personnel Protection Technology.
(U) PE 0603500F, Multi-disciplinary Adv Dev Space Technology
(U) PE 0604706F, Life Support System
(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 2002

BUDGET ACTIVITY: 03 - Advanced Technology Development

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

PROJECT: 3153

| COST ($ in Thousands) | | FY 2001 Actual | FY 2002 Estimate | FY 2003 Estimate | FY 2004 Estimate | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| 3153 | Non-Destructive Inspection Development | 10,099 | 6,692 | 3,488 | 3,819 | 4,153 | 4,233 | 4,313 | 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 designs, 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 current capability. This project provides technology to satisfy Air Force requirements to extend lifetimes 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 2002, Congress added $2.1 million for technology development investment for aging aircraft and $1.0 million for handheld holographic radar gun which explains the perceived decrease in FY 2003.

(U) FY 2001 ($ in Thousands)

(U) $6,912 Developed and demonstrated advanced technologies for improved capabilities in materials corrosion and fatigue monitoring and testing of aging aircraft to reduce operation and maintenance costs and to guarantee full operability and safety of the aircraft fleet. Transitioned to industry enhanced laser-generated ultrasonics for corrosion detection that use an alternate source of laser pulses to generate ultrasound and are efficiently transmitted through fiber optics. This enables laser-based ultrasonics sensors for remote access inspection. Transitioned a high-resolution digital radioscopy technique to evaluate and characterize cracks as an alternative to current X-ray film-based systems. This technique eliminates the need for hazardous material usage and enables electronic storage, transmission, and analysis of images.

(U) $1,731 Developed and demonstrated advanced inspection technologies supporting low-observable (LO) systems to enhance affordability and ensure full performance and survivability. Transition a LO material assessment tool for fighter aircraft. Develop an advanced multispectral LO nondestructive evaluation (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. Evaluate an advanced hand-held directional reflectometer for field level infrared signature NDE.

(U) $558 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 engine disks. Evaluated NDE benchmarks and develop an automated inspection capability to inspect engine rotary components for planned life extension of engine rotors. Developed a method to retain digital NDE records for extended periods and enable enhanced analysis of the aging aircraft fleet.

| RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) | DATE: February 2002 |
|---|---|
| BUDGET ACTIVITY: 03 - Advanced Technology Development | PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems / PROJECT: 3153 |

**(U) A. Mission Description Continued**

(U) FY 2001 ($ in Thousands) Continued

(U) $898 Developed and demonstrated advanced technologies for improved capabilities to monitor vehicle health and enable anticipatory condition-based maintenance actions on aerospace vehicles. Investigate interfaces to material behavior prediction tools. Established a NDE baseline capability method to detect changes in key material properties necessary for ten-year service life estimate prediction of solid rocket motors.

(U) $10,099 Total

(U) FY 2002 ($ in Thousands)

(U) $3,270 Develop and demonstrate advanced technologies for improved capabilities in materials corrosion, fatigue monitoring, and testing of aging aircraft to reduce operation 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 in aging aircraft while emphasing improving the probability of detecting serviceable cracks. Develop advanced methods to detect cracks in multiple layers to meet aging aircraft life extension requirements.

(U) $1,434 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. Transition nondestructive evaluation (NDE) benchmarks and continue development of an automated inspection capability to inspect engine rotary components for increased rotor life extension. Investigate candidate NDE techniques to extend the life of fracture-critical gas turbine engine components and develop techniques for subsurface component evaluations. Develop an advanced X-ray robotic brassboard to measure surface residual stress on full-scale turbine engine components.

(U) $1,988 Develop and demonstrate advanced inspection technologies supporting low-observable (LO) systems to enhance affordability and ensure full performance and survivability. Demonstrate an advanced multispectral LO NDE tool for assessing radio frequency signature (zone versus whole aircraft) that is real-time, lightweight and portable, user friendly, and covers multiple frequency bands. Complete and transition to the field an advanced hand-held directional reflectometer for field level infrared signature NDE.

(U) $6,692 Total

(U) FY 2003 ($ in Thousands)

(U) $1,141 Develop and demonstrate advanced technologies for improved capabilities in materials corrosion, fatigue monitoring, and testing of aging aircraft to reduce operation 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 to meet aging aircraft life extension requirements.

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

**(U) A. Mission Description Continued**

(U) FY 2003 ($ in Thousands) Continued

| | | |
|---|---|---|
| (U) | $1,409 | 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 NDE benchmarks. Test an automated inspection capability to 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 technology to increase measurement on shot peened surfaces. |
| (U) | $938 | 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 nondestructive evaluation tool for assessing radio frequency signature (zone vs. whole aircraft) that is real-time, small, lightweight, portable, user friendly, and covers multiple frequency bands. |
| (U) | $3,488 | 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 2002

BUDGET ACTIVITY: 03 - Advanced Technology Development

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

PROJECT: 3946

| COST ($ in Thousands) | FY 2001 Actual | FY 2002 Estimate | FY 2003 Estimate | FY 2004 Estimate | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 3946 Materials Transition | 21,694 | 14,458 | 3,173 | 5,256 | 5,582 | 5,746 | 4,779 | Continuing | TBD |

Note: In FY 2002, the deployed air base demonstration efforts in Project 3946, are transferred within this PE into Project 4918. In FY 2003, space unique tasks in Project 3946 will be transferred to PE 0603500F, Project 5032, in conjunction with the Space Commission recommendation to consolidate all space unique activities.

**(U) A. Mission Description**

Develops and demonstrates advanced material 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 material and processing technologies, providing needed initial incentive for their industrial development. Note: In FY 2002, Congress added $1.1 million for Metals Affordability Initiative, $3.4 million for advanced aluminum aerostructures, $2.8 million for ceramic matrix composites for engines, $2.1 million for plasma enhanced chemical deposition techniques, and $1.0 million for vapor growth carbon fiber which explains the perceived decrease in FY 2003.

(U) FY 2001 ($ in Thousands)

(U) $12,896 Developed and demonstrated advanced materials technologies for air vehicles and subsystems to enhance lift, propulsion, low-observable performance, and affordability of manned and unmanned air vehicles. Fabricated advanced aircraft brake materials with improved braking capacity, increased life, and better environmental stability. Fabricated large integrated composite structures for aircraft with reduced part count and assembly costs. Validated advanced non-linear optical materials for aircraft infrared countermeasures against far-infrared laser sources.

(U) $4,003 Developed and demonstrated advanced materials technologies for space vehicles and subsystems to provide enhanced surveillance and sensing capabilities and improved access to space. Develop improved material processes with increased yields for robust, high performance, and producible infrared focal plane array materials. Demonstrate materials and materials processing technologies to improve spacecraft component designs, performance, and reliability. Evaluate effort to develop the key data needed for reduced risk and increased confidence in organic matrix composite materials.

(U) $1,751 Developed and demonstrated advanced materials technologies to enhance the sustainability of Air Force areospace systems by lowering operations and maintenance costs and ensuring full operability and safety of systems and personnel. Validated an accelerated environmental effects test to determine in-service performance degradation of aircraft coating systems. Fabricated a large aperture Aluminum Oxynitride window material with high optical quality, durability, and strength. Transitioned the utilization of quantitative residual stress measurements in the fatigue life management of turbine engine disks.

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| BUDGET ACTIVITY: 03 - Advanced Technology Development | PE NUMBER AND TITLE: 0603112F Advanced Materials for Weapon Systems / PROJECT: 3946 |

**(U) A. Mission Description Continued**

(U) FY 2001 ($ in Thousands) Continued

(U) $442 Provided affordability education and training through the application of integrated product and process development tenets and cost modeling to the Air Force Science and Technology (S&T) environment. Training is focused on Air Force S&T scientists and engineers, including executives, middle managers, and all advanced development program managers. Initiated education and training of organic IPPD and cost modeling experts in each Air Force S&T Technical Directorate.

(U) $2,602 Developed technologies (i.e., utilities and shelters) that improve airmobile systems performance and reduce airlift requirements in support of Air Expeditionary Force (AEF) operations. Emphasized two areas of the AEF operations: deployed base systems and physical force protection. Developed scaled air-inflatable frames for large shelters. Demonstrated advanced cycle technologies for mobile heat pumps that reduce weight and volume by 30%. Fabricated a small-footprint fuel cell reformer capable of converting logistics fuels into hydrogen for fuel cell power generation. Fabricated structural retrofits and develop deployable blast protection reinforcement systems for buildings to reduce blast debris hazards.

(U) $21,694 Total

(U) FY 2002 ($ in Thousands)

(U) $8,566 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. Fabricate and characterize integrated composite structure assemblies for aircraft with reduced part count and assembly costs. Complete demonstration of advanced aircraft brake materials with improved braking capacity, increased life, and better environmental stability. Characterize advanced non-linear optical materials for aircraft infrared countermeasure against far-infrared laser sources.

(U) $1,557 Develop and demonstrate advanced materials and processing technologies for space vehicles and subsystems to provide enhanced surveillance capabilities, improved access to space, and improve the overall affordability of space vehicles. Characterize improved material processes with increased yields for robust, high performance, and producible infrared detector materials. Continue efforts to validate and demonstrate materials and materials processing technologies to improve performance, reliability, and affordability of spacecraft components and subsystems. Characterize effects of space exposure on advanced material systems.

(U) $4,335 Develop and demonstrate advanced materials and processing technologies to enhance the sustainability of Air Force aerospace systems by lowering operations and maintenance costs while ensuring full operability and safety of systems and personnel. Complete the characterization of a large-aperture Aluminum Oxynitride window material with high optical quality, durability, and strength. Evaluate the effectiveness of corrosion abatement treatments and transition the results.

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| PROJECT: 3946 | |

**(U) A. Mission Description Continued**

(U) FY 2002 ($ in Thousands) Continued

(U) $14,458 Total

(U) FY 2003 ($ in Thousands)

(U) $2,360 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 countermeasure against far-infrared laser sources and transition results. Conduct characterization of materials and processes for enhancing the reliability and maintainability of low-observable systems.

(U) $813 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. Initiate efforts to develop and characterize corrosion resistant coatings and corrosion prevention compounds for aging aircraft structures applications.

(U) $3,173 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 Structures

(U) PE 0603202F, Aerospace Propulsion Subsystem Integration

(U) PE 0603203F, Advanced Aerospace Sensors.

(U) PE 0603500F, Multi-disciplinary Adv Dev 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**

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| | PROJECT: 3946 |

**(U) E. Schedule Profile Continued**

(U) Not Applicable.

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

DATE: February 2002

BUDGET ACTIVITY: 03 - Advanced Technology Development

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

PROJECT: 4918

| COST ($ in Thousands) | FY 2001 Actual | FY 2002 Estimate | FY 2003 Estimate | FY 2004 Estimate | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 4918 Deployed Air Base Demonstrations | 0 | 1,400 | 2,118 | 1,938 | 2,415 | 2,461 | 2,507 | Continuing | TBD |

Note: In FY 2002, the deployed air base demonstration efforts in PE 0603205F, Project 4398, and PE 0603112F, Project 3946, are transferred into this PE in Project 4918.

**(U) A. Mission Description**

Supports the Air Expeditionary Forces (AEF) through technology development and demonstration of advanced rapid deployment airbase technologies that reduce airlift, setup times, manpower requirements, and sustainment costs. Develops and demonstrates efficient and cost-effective technologies to provide physical protection technologies including fire fighting, to AEF deployed warfighters and infrastructure. Develops and demonstrates affordable, rapid deployment technologies that ensure military readiness, support advanced weapon systems, and enable enhanced peacetime training operations.

(U) FY 2001 ($ in Thousands)

(U) $0 This effort was performed in PE 0603205F, Flight Vehicle Technology, Project 4398, Air Base Technology, ($7.794 million) and PE 0603112F, Advanced Materials for Weapon Systems, Project 3946, Materials Transition, ($2.770 million).

(U) $0 Total

(U) FY 2002 ($ in Thousands)

(U) $550 Demonstrate and transition advanced rapid deployment airbase technologies that reduce airlift, setup times, manpower requirements, and sustainment costs in support of AEF technologies. Develop deployable shelters/heat pump, power, and rapid airfield assessment technologies that improve air mobile systems performance and reduce airlift requirements in support of AEF. Develop advanced aircraft fire fighting agents and equipment. Demonstrate highly effective, deployable crash/rescue technologies based on three-dimensional foam technology to support AEF operations.

(U) $108 Demonstrate and transition affordable, rapid deployment technologies that ensure military readiness, maintain aerospace missions, support advanced weapon systems, and enable peacetime training operations. Develop advanced waste reactor technologies to support deployed waste management systems. Develop full-scale design and fabricate rapidly deployable mixed-base hydrogen peroxide production plant for airborne laser operations.

(U) $742 Demonstrate and transition efficient and cost-effective technologies to provide physical protection technologies to AEF deployed warfighters and infraststructure. Develop deployable protective and reactive blast suppression technologies to protect deployed warfighters. Develop autonomous ground 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 2002 ($ in Thousands) Continued

(U) $1,400 Total

(U) FY 2003 ($ in Thousands)

(U) $1,147 Demonstrate and transition advanced rapid deployment airbase technologies that reduce airlift, setup times, manpower requirements, and sustainment costs in support of Air Expeditionary Forces (AEF) technologies. Continue development of shelters, power, and rapid airfield assessment technologies that improve air mobile systems performance and reduce airlift requirements in support of AEF operations. Develop advanced aircraft fire fighting technologies such as fire fighting agents and equipment. Transition highly effective, deployable crash/rescue system based on three-dimensional foam technology to support AEF operations.

(U) $125 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) $846 Demonstrate and transition efficient and cost-effective technologies to provide physical protection technologies to AEF deployed warfighters and infrastructure. Develop deployable protective and reactive 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) $2,118 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 harmionize efforts and eliminate duplication.

**(U) D. Acquisition Strategy**

Not Applicable.

**(U) E. Schedule Profile**

| RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) | DATE: February 2002 |
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| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| 03 - Advanced Technology Development | 0603112F Advanced Materials for Weapon Systems | 4918 |

**(U) E. Schedule Profile Continued**

(U) Not Applicable.