CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification | DATE: **FEBRUARY 2002**

APPROPRIATION/BUDGET ACTIVITY
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7

R-1 ITEM NOMENCLATURE
0205633N, AVIATION IMPROVEMENTS

COST ($ in Millions)	Prior Year Cost		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Total PE Cost			**48.339**	**44.929**	**40.915**	**48.447**	**38.297**	**41.943**	**42.630**	**Continuing**	**Continuing**
W0601 Common Ground Equipment			**2.796**	**3.328**	**3.444**	**3.488**	**2.991**	**3.027**	**3.072**	**Continuing**	**Continuing**
W0852 Consolidated Automated Support System (CASS)			**7.845**	**6.682**	**6.757**	**6.740**	**6.707**	**6.805**	**6.914**	**Continuing**	**Continuing**
W1041 Aircraft Equip Reliability/Maintainability Improvement Program (AERMIP)			**0.735**	**0.622**	**0.620**	**0.631**	**0.534**	**0.540**	**0.546**	**Continuing**	**Continuing**
W1355 Aircraft Engine CIP			**36.963**	**30.431**	**30.094**	**37.588**	**28.065**	**31.571**	**32.098**	**Continuing**	**Continuing**
W9109 Aircraft Age Exploration Model Development				**2.478**							**2.478**
W9110 Nano-Composite Hard-Coat For Aircraft Coatings				**1.388**							**1.388**
Quantity of RDT&E Articles **Not Applicable**											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Common Ground Equipment is a Naval Aviation Project to apply new technology to common support equipment necessary to support multiple aircraft. Consolidated Automated Support System (CASS) is a standardized Automated Test Equipment (ATE) with computer assisted, multi-function capabilities to support the maintenance of aircraft subsystems and missiles. Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) is the only Navy program that provides engineering support for in-service out-of-production aircraft equipment, and provides increased readiness at reduced operational and support cost. The Aircraft Engine Component Improvement Program (CIP) develops reliability and maintainability (R&M) and safety enhancements for in-service Navy aircraft engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, fuel systems , fuels, and lubricants. Nano-Composite Hard-Coat for Aircraft Coatings is evaluation of erosion coatings for propulsion systems.

(U) JUSTIFICATION FOR BUDGET ACTIVITY:

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: **FEBRUARY 2002**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W0601 Common Ground Equipment					
COST ($ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost			**2.796**	**3.328**	**3.444**	**3.488**	**2.991**	**3.027**	**3.072**	**Continuing**	**Continuing**
RDT&E Articles Qty											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project introduces effective, efficient fleet support equipment through the application of new technology, thereby improving fleet supportability and aircraft readiness.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2001 ACCOMPLISHMENTS:

- (U) ($.389) Continued Advance Boresight Equipment (ABE) program.
- (U) ($.721) Continued Next Generation Munitions Handler (NGMH) program.
- (U) ($1.686) Completed Joint Engine Test Initiave (JETI) program.

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME **0205633N Aviation Improvements**	PROJECT NUMBER AND NAME W0601 Common Ground Equipment

2. FY 2002 PLANS:

- (U) ($.377) Continue ABE program.

- (U) ($.500) Continue NGMH program.

- (U) ($2.350) Initiate Shaft Engine Test Instrumentation program.

- (U) ($.101) Portion of extramural program reserved for Small Business Innovation Research (SBIR) assessment in accordance with 15 USC 638.

3. FY 2003 PLANS:

- (U) ($2.194) Continue NGMH program.

- (U) ($1.250) Complete Shaft Engine Test Instrumentation program.

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W0601 Common Ground Equipment

(U) B. PROGRAM CHANGE SUMMARY:

	FY2001	FY2002	FY2003
(U) FY 2002 President's Budget:	3.224	3.358	
(U) Adjustments from the FY2002 President's Budget:	-0.428	-0.030	
(U) FY 2003 President Budget Submit:	2.796	3.328	3.444

CHANGE SUMMARY EXPLANATION

(U) Funding:

The FY 2001 net decrease of $.428 million is for reprioritization of requirements within the Navy. The FY 2002 decrease of $.030 million is for an undistributed congressional reduction.

(U) Schedule: Advanced Boresight Equipment (ABE)-FY2001, MSIII-FY2002, MSIII , Prior to MSIII, testing extended due to merging AH-1Z requirements.
Next Generation Munitions Handler (NGMH)-12/05 slipped to 12/06-Unforseen development initiatives between aircraft platforms and new weapons interface.
Joint Engine Test Initiative (JETI)-12/01 slipped to 03/02 due to unforseen additional required testing.

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete
APN 070500 Ground Support Eq	102.127	126.542	164.441	176.962	184.293	180.190	169.183	Continuing

Related RDT&E: Not Applicable

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-7	0205633N Aviation Improvements	W0601 Common Ground Equipment	

(U) D. ACQUISITION STRATEGY: * This is a non-ACAT program. Field activities propose tentative RDT&E projects. Internal panel merits and selects projects. Field activities develop projects and submit results. Operational Advisory Group (OAG) process selects projects to transition to procurement (APN-7).

(U) E. SCHEDULE PROFILE:

	FY 2001	FY 2002	FY 2003	TO COMPLETE
(U) Program Milestones				
Advanced Boresight Equipment			12/02 MS III	
Next Generation Munitions Handler				12/06 (MSIII)
Joint Engine Test Initiative		03/02 (MS III)		
(U) Engineering Milestones				
(U) T&E Milestones				
Joint Engine Test Initiative	4/01 (DT)			
Shaft Engine Test Instrumentation			2/03 (DT)	
(U) Contract Milestones				
Joint Engine Test Initiative				
Advanced Boresight Equipment		01/02 (Contract Award)		

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **FEBRUARY 2002**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**		PROGRAM ELEMENT 0205633N Aviation Improvements			PROJECT NUMBER AND NAME W0601 Common Ground Equipment							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	Various	Various	11.955	0.050	10/00	0.800	01/02	1.718	01/03	Continuing	Continuing	
Subtotal Product Development			11.955	0.050		0.800		1.718		Continuing	Continuing	
Remarks:												
Miscellaneous Support	Various	Various		2.012	01/01	2.127	01/02	1.726	12/02	Continuing	Continuing	
Subtotal Support				2.012		2.127		1.726		Continuing	Continuing	
Remarks:												

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)

DATE: **FEBRUARY 2002**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-7**

PROGRAM ELEMENT: 0205633N Aviation Improvements

PROJECT NUMBER AND NAME: W0601 Common Ground Equipment

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Miscellaneous Test & Evaluation	Various	Various		0.734	01/01	0.300	01/02			Continuing	Continuing	
Subtotal T&E				0.734		0.300				Continuing	Continuing	

Remarks:

SBIR Assessment						0.101					0.101	
Subtotal Management						0.101					0.101	

Remarks:

Total Cost			11.955	2.796		3.328		3.444		Continuing	Continuing	

Remarks:

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: FEBRUARY 2002			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W0852 Consolidated Automated Support System					
COST ($ in Millions)	Prior Year Cost		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost			**7.845**	**6.682**	**6.757**	**6.740**	**6.707**	**6.805**	**6.914**	**Continuing**	**Continuing**
RDT&E Articles Qty											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Consolidated Automated Support System (CASS) project designs, and develops modular constructed automated test equipment with computer-assisted, multi-functional capability based, standardized hardware, and software elements. CASS responds to Fleet Commanders' expressed requirements to correct serious deficiencies in existing automatic test equipment. Program objectives are: (1) increase material readiness; (2) reduce life cycle costs through standarization; (3) improve tester sustainability at depot, and intermediate maintenance levels; (4) reduce proliferation of unique test equipment, and (5) provide test capability for existing and future avionics/electronics systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2001 ACOMPLISHMENTS:

- (U) ($7.000) Continued development of instrument control upgrades and virtual instruments (RTCASS).

- (U) ($ .845) Continued CASS station upgrades.

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W0852 Consolidated Automated Support System

3. FY 2002 PLANS:
- (U) ($4.747) Initiate development of a Synthetic Instrument Package.
- (U) ($1.733) Continue CASS station upgrades.
- (U) ($ .202) Portion of extramural program reserved for Small Business Innovation Research (SBIR) assessment in accordance with 15 USC 638.

4. FY 2003 PLANS:
- (U) ($3.829) Continue development of a Synthetic Instrument Package.
- (U) ($2.928) Continue CASS station upgrades.

(U) B. PROGRAM CHANGE SUMMARY:

	FY2001	FY2002	FY2003
(U) FY 2002 President's Budget:	7.890	6.741	
(U) Adjustments from the FY202 President's Bud	-0.045	-0.059	
(U) FY 2003 President's Budget Submit:	7.845	6.682	6.757

CHANGE SUMMARY EXPLANATION

(U) Funding:

The FY2001 net decrease of $ .045 million consist of a decrease of $.229 million for a Small Business Innovative Research Assessment (SBIR) and a decrease of $.057 million for reprioritization of requirements within the Navy offset by a $.241 million increase for continued CASS upgrades. The FY 2002 net decrease of $.059 million consist of a decrease of $.060 million for an undistributed congressional reduction offset by an increase of $.001 million for continued CASS upgrades.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete
APN 070500 CASS	120.054	105.145	90.588	93.381	76.972	90.111	91.852	Continuing

Related RDT&E: Not Applicable

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W0852 Consolidated Automated Support System

(U) D. ACQUISITION STRATEGY: The stragtegy for Parts Obsolescence is a combined effort with the contractor, any changes to present strategy will add additional risks to achieving a continuous production schedule, and will cause technical uncertainty. For new technologies we will have competitive studies to ascertain the market technology; which, will result in maximum information for minimum expenditure.

(U) E. SCHEDULE PROFILE:

	FY 2001	FY 2002	FY 2003	TO COMPLETE
(U) Program Milestones				
(U) Engineering Milestones				
(U) T&E Milestones				
(U) Contract Milestones				
RTCASS	4/01 (Contract Award)			
Synthetic Instrument Package		3/02 (Contract Award)	3/03 (Contract Award)	

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)

DATE: **FEBRUARY 2002**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-7**

PROGRAM ELEMENT: 0205633N Aviation Improvements

PROJECT NUMBER AND NAME: W0852 Consolidated Automated Support System

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	C/FFP	LMC	12.900	7.000	04/01	0.608	04/02			0.000	20.508	20.508
Hardware Development	Various	Various		0.845		1.125	01/02	2.928	01/03	Continuing	Continuing	
Hardware Development	Various	Various				4.747	03/02	3.829	03/03	Continuing	Continuing	
Subtotal Product Development			12.900	7.845		6.480		6.757		Continuing	Continuing	

Remarks:

Subtotal Support												

Remarks:

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)									DATE: **FEBRUARY 2002**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvements			PROJECT NUMBER AND NAME W0852 Consolidated Automated Support System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Subtotal T&E												
Remarks:												
SBIR Assessment						0.202					0.202	
Subtotal Management						0.202					0.202	
Remarks:												
Total Cost			12.900	7.845		6.682		6.757		Continuing	Continuing	
Remarks:												

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: FEBRUARY 2002			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W1041 Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP)					
COST ($ in Millions)	Prior Years Cost		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost			**0.735**	**0.622**	**0.620**	**0.631**	**0.534**	**0.540**	**0.546**	**Continuing**	**Continuing**
RDT&E Articles Qty											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

AERMIP is the only Navy program which provides Research, Development, Test & Evaluation (RDT&E) engineering support specifically for in-service, out-of-production aircraft equipment. AERMIP increases readiness through Reliability and Maintainability (R&M) and safety improvements to existing systems and equipment installed in Naval aircraft. It also provides a transition vehicle to deploy Total Ownership Cost (TOC) reduction initiatives through flight-test support and Fleet Test & Evaluation. It meets affordable readiness objectives by providing a cost-effective solution to obsolescence problems encountered when service lives are extended. AERMIP promotes commonality and standardization across aircraft platform lines and among the services through extension of application and use of non-developmental items. AERMIP also decreases life cycle costs through reduced operational and support costs. AERMIP facilitates the Operational, Safety and Improvement Program by applying proven low-risk solutions to current fleet problems. AERMIP also funds high priority flight testing which is not associated with any acquisition or development program under the Flight Test General (FTG) task.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2001 ACCOMPLISHMENTS:

- ($.735) Continued Total Ownership Cost (TOC) reduction corrosion initiatives. Completed the improved hydraulic seals investigation and validation project. Initiated the aircraft canopy crazing mitigation project. Investigated high value return on investment candidates and transition of TOC reduction initiatives.

2. FY 2002 PLANS:

- ($.603) Complete the Corrosion Preventative Compound initiative by developing a best practices plan to be implemented by all Naval Aircraft. Initiate the Common Instrument Program. Investigate high value pay back return on investment candidates and transition of TOC reduction initiatives.

- ($.019) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W1041 Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP)

3. FY 2003 PLANS:

- ($.620) Continue the Common Instrument Program. Complete the aircraft canopy crazing mitigation project. Initiate the Corrosion Sensor initiative that will work in conjunction with the previously completed Corrosion Preventative Compound initiative to determine if corrosion sensors can be utilized in development of a condition based maintenance philosophy for corrosion preventative maintenance. Investigate high value pay back return on investment candidates and transition of TOC reduction initiatives.

(U) B. PROGRAM CHANGE SUMMARY:

	FY2001	FY2002	FY2003
(U) FY 2002 President's Budget:	0.739	0.628	
(U) Adjustments from the FY2002 President's Budget:	-0.004	-0.006	
(U) FY 2003 President's Budget Submit:	0.735	0.622	0.620

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY2001 decrease of $.004 consists of a $.002 million decrease for Small Business Innovative Research assessment and a $.002 million decrease for reprioritization of requirements within the Navy. The FY2002 decrease of $.006 is for an undistributed Congressional reduction.

(U) Schedule: Not applicable

(U) Technical: Not applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable

(U) D. ACQUISITION STRATEGY: This is a non-ACAT program with no specific acquisition strategies.

(U) E. SCHEDULE PROFILE: Not applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: FEBRUARY 2002			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program					
COST ($ in Millions)	Prior Years Cost		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost			**36.963**	**30.431**	**30.094**	**37.588**	**28.065**	**31.571**	**32.098**	**Continuing**	**Continuing**
RDT&E Articles Qty											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Aircraft Engine Component Improvement Program (CIP) provides the only source of critical design and development engineering support to resolve safety, reliability and maintainability deficiencies of in-service Navy aircraft propulsion systems. The highest priority issues CIP addresses concern safety-of-flight deficiencies which account for approximately 80% of CIP efforts. The program also corrects service-revealed deficiencies, improves Operational Readiness (OR) and Reliability and Maintainability (R&M), and reduces platform Life Cycle Cost (LCC). Budgets are allocated across platform-specific teams and multi-platform product support teams based upon long term strategies to achieve safety and affordable readiness goals; the R-3 exhibit details annual portions of those long-term plans. CIP tasks have reduced the rate of in-flight aborts, safety incidents, non-mission capable rates, scheduled and unscheduled engine removals, maintenance work hours, and overall cost of ownership. This is accomplished through the maintenance and validation of specification performance, testing to qualify engineering changes, verifying life limits, and improving the inherent reliability of the propulsion system as an integral part of Reliability Centered Maintenance (RCM) initiatives. Historically, the missions, tactics, and environmental exposure of military aircraft systems change to meet new threats or operational demands, and often result in unforeseen problems, which if not corrected, can cause critical safety/readiness degradation, such as those experienced during DESERT SHIELD/DESERT STORM operations due to sand erosion. In addition, new problems arise through actual use during deployment of the aircraft. Development programs, while geared to resolve as many problems as possible before deployment, cannot duplicate actual operations or account for the vast array of environmental and usage variables, particularly when aircraft missions vary from those the aircraft was designed to perform. Therefore, it has been found that CIP can provide an immediate engineering response to these flight-critical problems and accelerated engine testing can avoid potential problems. CIP starts after development and Navy acceptance of the first production article and addresses usage and life problems not covered by warranties. CIP addresses engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, and fuel and lubricant systems. CIP efforts continue over the system's life, gradually decreasing to a minimum level sufficient to maintain the reliability, and decrease the operating costs, of older inventory. CIP is a highly leveraged and cooperative tri-service program with Foreign Military Sales participation.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2001 ACCOMPLISHMENTS:

(U) ($32.753) Platform-specific efforts:

T56 engine (P-3, E-2, C-2, C-130) Began and implemented the Engine Monitory System version 7.0 upgrade. Maintained safety margins by investigating turbine coatings and developed new designs, continued propeller integration efforts with potential propeller designs, performed engine hot section corrosion and fatigue analysis, and continued bearing improvements.

E-2/C-2/C-130 Began incorporation of improved blade heaters. Began development of improved propeller control system.

S-3 Completed new fan blade design. Completed safety related fan High Pressure Compressor (HPC) life limit analysis. Completed Main Fuel Control (MFC) durability investigation. Performed analyses on commercial hardware incorporation analyses. Continued validation and implementation on recommended part life changes.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements	PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program

1. FY 2001 ACCOMPLISHMENTS (CONT):

F/A-18C/D Identified obsolescence problems, continued efforts on bushing, aft cooling plate, low pressure turbine nozzle and bolted dome combustor redesign efforts. Continued life management issues including the fleet leader program, engine analysis studies, and improved analytical models, analyzed engine performance data and updated mission analysis.

Mature Aircraft Addressed the top readiness degraders and AVDLR costs; implemented efforts on the J52 engine (EA-6B) ASMET test, performed annual maintenance awareness brief and annual P-408A major engine inspection program. Continued to study and implement solutions to aging aircraft issues and future obsolescence problems. Began redesign of diffuser case for increased life.

H-2/H-60 Completed integration of the improved Digital Electronic Control Unit (DECU) to the H-60 fleet. Completed implementation of I-level screening techniques for the DECU and Hydro-Mechanical units, continued the Advanced Helicopter Transmission Lubricant Program, extended transmission component lives, increased readiness by reducing corrosion, continued Mission Profile Data Collection and Dynamic Component Life Limit efforts. Continued time on wing and Mean Time Between Removals (MTBR) cost drivers initiatives including compressor durability, Titanium Nitrates (TiN) coating and three-stage turbine.

AV-8B Completed design efforts associated with the exhaust duct cracking, and failure of the Low Pressure Compressor (LPC) and HPT blade cracking and shaft sulfidation. Completed Shell Deer Park fuel burner rig testing to eliminate all risk associated with fuel incompatibility in the F402 engines. Addressed top readiness degraders and AVDLR costs; safety of flight issues, engine removal drivers, and mission failure drivers, assess life management program issues for engine components.

H-53/H-46/H-3 Started Bleed Valve redesign. Continued efforts on the top cause for engine removals; completed transition of program to reliability-centered maintenance; implemented goals at depot level to improve compressor performance and engine power, resolved oil consumption and leakage problems, and improved on wing times.

H-1 Addressed top safety concerns as ranked by the OAG and System Safety Working Group, continued to update Navy maintenance manuals, continued to improve time-between-overhaul and reduced impact of high-time parts. Continued improvement program to the Bleed Valve, T5 Harness, Gas Generator Case Diffuser Inlet, and Compressor Stub Shaft. Initiated development of environmentally friendly repairs such as High Velocity OXY fuel coatings to replace chrome and nickel plate repairs.

T-45 Continued investigation of engine vibration problems to resolve safety issue. Addressed platform safety, increase predicted part life confidence, provided mission profile updates and life cycle management. Continued Critical Parts Life management to ensure no overfly of parts, continued life management to double most expensive parts life, and addressed obsolescence issues.

F-14B/D Completed final life limit updates for F110-GE-400 engine. Continued High Pressure Compressor Spool life improve redesign. Addressed extension of component life and the reduction of maintenance hours. Continued improvements to propulsion system safety through an active life management program for critical rotating components, reduced the engine Non-recoverable In-Flight Shutdown Rate by 75% by 2003, reduced the propulsion system related mission abort rate by 50% by 2003.

(U) ($4.210) Multi-Platform Product Support Teams Continued projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W1355 Aircraft Engine Component Improvement Program

2. FY 2002 PLANS:

(U) ($24.611) Platform-specific efforts:

T56 engine (P-3, E-2, C-2, C-130) Continue the implementation of the Engine Monitory System version 7.0 upgrade. Maintain safety margins by investigating turbine coatings and develop new designs, continue propeller integration efforts with potential propeller designs, perform engine hot section corrosion and fatigue analysis, and continue bearing improvements.

E-2/C-2/C-130 Continue incorporation of improved blade heaters. Continue development of improved propeller control system.

S-3 Initiate High Pressure Compressor (HPC) life limit implementation. Continue validation and implementation of High Pressure Turbine (HPT), Low Pressure Turbine (LPT), and Fan critical part life limit changes. Initiate the development of Combustion Chamber Frame (CCF) and HPT physics based thermal models. Complete the development of LPT physics based thermal models. Collect engine parameter flight data required to perform updated engine mission analysis. Initiate the development of improved Eddy Current (EC) inspection techniques for small holes and specific features. Analyze and correlate HPC EC inspection requirements to critical part Fracture Mechanics (FM) capabilities. Investigate propulsion and power system obsolescence. Conduct engine component and propulsion and power electrical system reliability/maintainability analysis. Conduct commercial critical part hardware commonality analysis.

Mature Aircraft Address the top readiness degraders and AVDLR costs; implement efforts on the J52 engine (EA-6B) ASMET test, perform annual maintenance awareness brief and annual P-408A major engine inspection program. Continue to study and implement solutions to aging aircraft issues and future obsolescence problems. Continue redesign of diffuser case for increased life.

H-2/H-60 Continue the Advanced Helicopter Transmission Lubricant Program, extend transmission component lives, increase readiness by reducing corrosion, continue Mission Profile Data Collection and Dynamic Component Life Limit efforts. Continue time on wing and Mean Time Between Removals (MTBR) cost drivers initiatives including compressor durability, Titanium Nitrates (TiN) coating and three-stage turbine.

AV-8B Address top readiness degraders and AVDLR costs; safety of flight issues, engine removal and mission failure drivers, assess life management program issues for engine components. Projects will include but not be limited to: ASMET testing, support of a Fleet Leader Program, Analytical Condition Insepction (ACI), Engine Life Management Program (ELMP) execution and design fixes for any service revealed deficiencies.

H-53/H-46/H-3 Complete bleed valve redesign. Continue efforts on the top cause for engine removals; improve on wing times; address top safety concerns as ranked by the Operational Advisory Group (OAG); continue reliability-centered maintenance program; improve compressor blade retention design; and initiate development of corrosion resistant bearing designs.

H-1 Address top safety concerns as ranked by the OAG and System Safety Working Group, continue to update Navy maintenance manuals, continue to improve time-between-overhaul and reduce impact of high-time parts (T700 and T400); address Blisk, Rear Shaft, Spacer & Tierod Life Update (T700), Continue development of environmentally friendly repairs such as High Velocity OXY fuel coatings to replace chrome and nickel plate repairs; and initiate development of Durability Project (T700-401/-401C), N5 Blades w/ tip cap & Nozzles, T700 TiN Coating (Test Articles, Corrosion/Erosion/Full Sand Engine Testing), T700 Diagnostics Life Mgt Performance Evaluation (IMD), T700 Diagnostics (Performance Evaluation), Durability Project (T700-401/-401C), T700 TiN Coating (Pending Pass/Fail... Incorp TiN), EPAMs Mission Update to 4BN, T700 Diagnostics (Performance Evaluation), T400 Improved Compressor Turbine Stub Shaft, T400 Improved Gas Generator Case Diffuser Inlet, T400 Improved Compressor Coating, T400Life Management, Study T400 Parts Obsolescence.

F-14B/D Address obsolescence of electrical components. Continue high pressure turbine redesign efforts. Address extension of component life and the reduction of maintenance hours. Continue improvements to propulsion system safety through an active life management program for critical rotating components. Continue efforts to reduce the engine non-recoverable in-flight shutdown Rate and propulsion system related mission abort rate.

(**U) ($4.899) Multi-Platform Product Support Teams** Continue projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

(U) ($.921) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements	PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program

3. FY 2003 PLANS:

(U) ($25.239) Platform-specific efforts:

T56 engine (P-3, E-2, C-2, C-130) Continue the implementation of the Engine Monitory System version 7.0 upgrade. Maintain safety margins by investigating turbine coatings and develop new designs, continue propeller integration efforts with potential propeller designs, perform engine hot section corrosion and fatigue analysis, and continue bearing improvements.

E-2/C-2/C-130 Continue incorporation of improved blade heaters. Continue development of improved propeller control system.

S-3 Perform reliability/maintainability analysis on engine components, propulsion and power electrical system addressing top readiness degraders and AVDLR cost drivers. Evaluate commercial hardware for TF34-400B applicability. Continue the development of Combustion Chamber Frame (CCF). Perform obsolence analysis on propulsion and power systems. Implement High Pressure Compressor field management plan. Continue validation and implementation of High Pressure Turbine (HPT), Low Pressure Turbine (LPT), and fan critical part field management plans. Using LPT physics based thermal models, continue the HPT physics based thermal models. Collect and analyze engine parameter flight data to update engine mission profiles. Develop improved Eddy Current (EC) inspection probes and techniques to minimize process time. Analyze and correlate HPC EC inspection requirements to critical part Fracture Mechanics (FM) capabilities.

Mature Aircraft Address the top readiness degraders and AVDLR costs; continue efforts on the J52 engine (EA-6B) ASMET test, perform annual maintenance awareness brief and annual P-408A major engine inspection program. Continue to study and implement solutions to aging aircraft issues and future obsolescence problems. Continue redesign of components for increased life.

H-2/H-60 Continue the Advanced Helicopter Transmission Lubricant Program, extend transmission component lives, increase readiness by reducing corrosion, continue Mission Profile Data Collection and Dynamic Component Life Limit efforts. Continue time on wing and Mean Time Between Removals (MTBR) cost drivers initiatives including compressor durability, Titanium Nitrates (TiN) coating and three-stage turbine.

AV-8B Address top readiness degraders and AVDLR costs; safety of flight issues, engine removal and mission failure drivers, assess life management program issues for engine components. Projects will include but not be limited to: ASMET testing, support of a Fleet Leader Program, Analytical Condition Insepction (ACI), Engine Life Management Program (ELMP) execution and design fixes for any service revealed deficiencies.

H-53/H-46/H-3 Continue efforts on the top cause for engine removals based on the latest metric and trending data available; improve on wing times; address top safety concerns as ranked by the Operational Advisory Group (OAG) and System Working Group (SSWG); continue reliability-centered maintenance program; improve compressor blade retention design; and continue development of corrosion resistant bearing designs. Initiate programs to improve the mean time between engine removal based upon continued implementation of reliability center maintenance initiatives. Conduct life management analyses to resolve critical rotating component issues based upon engine structural integrity assessments and the master life management plan.

H-1 Address top safety concerns as ranked by the OAG and System Safety Working Group, continue to update Navy maintenance manuals, continue to improve time-between-overhaul and reduce impact of high-time parts (T700 and T400); address Blisk, Rear Shaft, Spacer & Tierod Life Update (T700), Continue development of environmentally friendly repairs such as High Velocity OXY fuel coatings to replace chrome and nickel plate repairs; and initiate development of Durability Project (T700-401/-401C), N5 Blades w/ tip cap & Nozzles, T700 TiN Coating (Test Articles, Corrosion/Erosion/Full Sand Engine Testing), T700 Diagnostics Life Mgt Performance Evaluation (IMD), T700 Diagnostics (Performance Evaluation), Durability Project (T700-401/-401C), T700 TiN Coating (Pending Pass/Fail... Incorp TiN), EPAMs Mission Update to 4BN, T700 Diagnostics (Performance Evaluation), T400 Improved Compressor Turbine Stub Shaft, T400 Improved Gas Generator Case Diffuser Inlet, T400 Improved Compressor Coating, T400Life Management, Study T400 Parts Obsolescence.

F-14B/D Address obsolescence of electrical components. Complete high pressure turbine redesign efforts. Address extension of component life and the reduction of maintenance hours. Continue improvements to propulsion system safety through an active life management program for critical rotating components. Continue efforts to reduce the engine non-recoverable in-flight shutdown Rate and propulsion system related mission abort rate.

(U) ($4.855) Multi-Platform Product Support Teams Continue projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W1355 Aircraft Engine Component Improvement Program

(U) B. PROGRAM CHANGE SUMMARY:

	FY2001	FY2002	FY2003
(U) FY 2002 President's Budget:	38.622	30.702	
(U) Adjustments from the FY2002 President's Budget:	-1.659	-0.271	
(U) FY 2003 President's Budget Submit:	36.963	30.431	30.094

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 2001 decrease of $1.659 million reflects a decrease of $.786 million for Small Business Innovative Research assessment and a decrease of $.873 million for reprioritization of requirements within the Navy.
FY 2002 decease of $.271 million reflects an undistributed congressional reduction.

(U) Schedule: Not applicable

(U) Technical: Not applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

PE 0203752A (Aircraft Engine CIP Army)
PE 0207268F (Aircraft Engine CIP Air Force)
PE 0602236N (Turbine Engine Improvement, TOC, FNC)
PE 0603236N (Turbine Engine Improvement, TOC, FNC)
PE 0602114N (UAV Propulsion Autonomous Operations FNC)
PE 0603114N (UAV Propulsion Autonomous Operations FNC)

(U) D. ACQUISITION STRATEGY: Not applicable

(U) E. Schedule Pofile : Not applicable

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)

DATE: **FEBRUARY 2002**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-7**

PROGRAM ELEMENT: 0205633N Aviation Improvements

PROJECT NUMBER AND NAME: W1355 Aircraft Engine Component Improvement Program

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
F110 Engine Program*	SS/CPAF	GE - OHIO	12.786	1.890	12/00	2.100	12/01	2.100	12/02		18.876	18.876
F402 Engine Program	SS/CPFF	ROLLS ROYCE- UK	19.195	2.487	12/00	3.320	12/01	3.320	12/02		28.322	28.322
F404/T58/T64 Engine Programs	SS/CPFF	GE - MASS	20.873	7.813	04/01	1.672	10/01	1.672	10/02		32.030	32.030
J52 Engine Program	SS/CPFF	P&W - FLORIDA	6.406	2.500	12/00	2.600	12/01	2.600	12/02		14.106	14.106
T56 Engine Program	SS/CPFF	INDIANA	3.575	1.700	02/01	2.005	02/02	2.005	02/03		9.285	9.285
F405 Engine Program	SS/CPAF	ROLLS ROYCE- UK	4.544	1.940	12/00						6.484	6.484
F/A 18 E/F Engine Program	SS/CPFF	GE- MASS	0.664								0.664	0.664
T700 Engine Program	SS/CPFF	GE - MASS	3.092	1.050	11/00	1.255	01/02	1.255	01/03		6.652	6.652
TF34 Engine Program	SS/CPFF	GE - MASS	3.840	0.600	11/00	0.775	11/01	0.775	11/02		5.990	5.990
V22 Engine Program	SS/CPFF	GE- MASS	1.000								1.000	1.000
Props Program	SS/CPFF	HAM SUNSTRAND - CONN	3.395	1.000	12/00	1.155	12/01	1.155	12/02		6.705	6.705
Contracts under 1.0M aggregate	VARIOUS	VARIOUS	10.659	1.107	10/00	1.200	10/01	1.200	10/02	Continuing	Continuing	
Lab Field Activity (1.0M or more)	WX	NAWCAD-PAX	86.306	12.316	10/00	10.878	10/01	11.462	10/02	Continuing	Continuing	
Other in-house support (1.0M or less)	VARIOUS	VARIOUS	13.740	0.750	10/00	0.840	10/01	0.840	10/02	Continuing	Continuing	
GFP Fuel Increment	MIPR	KAFB - TEXAS	3.695	0.300	10/00	0.360	10/01	0.360	10/02	Continuing	Continuing	
Award Fees**	SS/CPAF			0.610		0.450		0.450		Continuing	Continuing	
Subtotal Product Development			193.770	36.063		28.610		29.194		Continuing	Continuing	

Remarks:

* F110 (F14 B/D) AF contract has a ten year period of performance.

**Award fees for F110 (.210), F402 (.240) and F405 (.160) F405 award fee in FY01 only.

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)					DATE: **FEBRUARY 2002**							
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvmeents			PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Other in-house less than 1.0M	VARIOUS	VARIOUS	3.146	0.650	10/00	0.650	10/01	0.650	10/02	Continuing	Continuing	
Subtotal Support			3.146	0.650		0.650		0.650		Continuing	Continuing	
Remarks:												
Other in-house less than 1.0M	VARIOUS	VARIOUS	2.394	0.150	10/00	0.150	10/01	0.150	10/02	Continuing	Continuing	
Subtotal T&E			2.394	0.150		0.150		0.150		Continuing	Continuing	
Remarks:												
Other in house less than 1.0M	VARIOUS	VARIOUS	0.397	0.100	10/00	0.100	10/01	0.100	10/02	Continuing	Continuing	
SBIR Assessment						0.921					0.921	
Subtotal Management			0.397	0.100		1.021		0.100		Continuing	Continuing	
Remarks:												
Total Cost			199.707	36.963		30.431		30.094		Continuing	Continuing	
Remarks:												

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: **February 2002**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N, Aviation Improvements					PROJECT NUMBER AND NAME W9109, Aircraft Aging Exploration Model Development					
COST ($ in Millions)	Prior Years Cost		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost				**2.478**							**2.478**
RDT&E Articles Qty **Not Applicable**											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Aircraft AGE Exploration Model for Naval aircraft platforms. The model will use existing Naval aircraft data to establish connections between age and reliability, maintainability, and readiness and will provide the Navy with a valuable tool for understanding, predicting, and communicating impacts of decisions to extend aircraft service lives and for mitigating risks associated with these decisions.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

2. FY 2002 PLANS:

- (U) ($ 0.300) Analyze age impacts on multiple aircraft and aircraft systems to determine contributing factors to changes in reliability, maintainability and readiness.

- (U) ($ 1.808) Develop a computer model integrating with existing data systems to predict trends and impacts on aircraft reliability, maintainability and readiness as aircraft and systems age.

- (U) ($ 0.370) Perform failure analysis and model verification testing

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N, Aviation Improvements	W9109, Aircraft Aging Exploration Model Development

(U) B. PROGRAM CHANGE SUMMARY:

	FY2001	FY2002	FY2003
(U) FY 2002 President's Budget:		0	
(U) Adjustments from the President's Budget:		2.478	
(U) FY 2003 President's Budget Submit:		2.478	

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2002 increase of $2.478 million reflects a congressional add for Aircraft AGE Exploration Model Development

(U) Schedule: Not applicable

(U) Technical: Not applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:
Aircraft Equipment Reliability/Maintainability Improvement Program, W1041

(U) D. ACQUISITION STRATEGY: This is a non-ACAT program with no specific acquisition strategies.

(U) E. SCHEDULE PROFILE: Not applicable

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2002**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**		PROGRAM ELEMENT 0205633N, Aviation Improvements			PROJECT NUMBER AND NAME W9109, Aircraft Aging Exploration Model Development							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Subtotal Product Development												
Software Development	SS/CPFF	ManTech				1.708	03/02				1.708	1.708
Technical Data	SS/CPFF	ManTech				0.010	03/02				0.010	0.010
GFE	SS/CPFF	ManTech				0.050	02/02				0.050	0.050
Subtotal Support						1.768					1.768	

Remarks:

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2002**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N, Aviation Improvements			PROJECT NUMBER AND NAME W9109, Aircraft Aging Exploration Model Development						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Subtotal T&E												
Remarks:												
Contractor Engineering Support	SS/CPFF	ManTech				0.220	02/02				0.220	0.220
Government Engineering Support	WX	NAWCAD				0.320	01/02				0.320	
Program Management Support	WX	NAWCAD				0.160	01/02				0.160	
Travel	WX	NAWCAD				0.010	01/02				0.010	
Subtotal Management						0.710					0.710	
Remarks:												
Total Cost						2.478					2.478	
Remarks:												

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: **FEBRUARY 2002**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W9110 Nano-Composite Hard-Coat for Aircraft Coatings					
COST ($ in Millions)	Prior Years Cost		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost				**1.388**							**1.388**
RDT&E Articles Qty											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Nano-Composite Hard-Coat for Aircraft coatings program will be used to investigate the use of Devitrified Nano-Composite Steel (DNC) as a potentially superior erosion coating for the T700 engine. The development of erosion coatings is critical to minimize the harsh erosive effects of the sandy environments encountered by our forces in Southwest Asia and other theaters of operations. Erosion effects are one of the primary drivers for T700 compressor stator-rotor assembly repair and replacement. The successful application of DNC may significantly improve T700 Operational Readiness (OR) and Reliability and Maintainability (R&M), and reduce platform Life Cycle Cost (LCC).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2001 ACCOMPLISHMENTS:

(U) Not applicable

2. FY 2002 PLANS:

(U) ($1.388):
* Acquire 6 sets of: compressor stator-rotor assemblies, gas generator assemblies, miscellaneous hardware to build-up test engines.
* Coat and restore leading edges of compressor airfoils.
* Coat gas engerator turbine blades
* Build engines to 1.0 specifications.
* Operate two engines at the NAWCAD PAX Helicopter Transmission Test Facility for a transmission superfinish test and a simultaneous High Cycle Fatigue Test.
* Perform Sand Ingestion Testing on four engines; each with a select hardware configuration.

3. FY 2003 PLANS:

(U) Not applicable

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **FEBRUARY 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W9110 Nano-Composite Hard-Coat for Aircraft Coatings

(U) B. PROGRAM CHANGE SUMMARY:

	FY2001	FY2002	FY2003
(U) FY 2002 President's Budget :		0	
(U) Adjustments from the FY2002 President's Budget:		1.388	
(U) Fy 2003 President's Budget Submit:		1.388	

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 2002 increase of $1.388 million reflects Congressional Add for Nano-Composite Hard-Coat for Aircraft Coatings.

(U) Schedule: Not applicable

(U) Technical: Not applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Not applicable

(U) D. ACQUISITION STRATEGY: Not applicable

(U) E. Schedule Pofile : Not applicable

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **FEBRUARY 2002**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**		PROGRAM ELEMENT 0205633N Aviation Improvements			PROJECT NUMBER AND NAME W9110 Nano-Composite Hard-Coat for Aircraft Coatings							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Hardware/Engineering Support	SS/CPFF	GENERAL ELECTRIC				0.300	03/02				0.300	0.300
Contracts under 1.0M aggregate	VARIOUS	VARIOUS				0.723	03/02				0.723	0.723
Lab Field Activity (1.0M or less)	WX	VARIOUS				0.065	03/02				0.065	
Subtotal Product Development						1.088					1.088	

Remarks:

R-1 SHOPPING LIST - Item No. 190

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)											DATE: FEBRUARY 2002		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvmeents			PROJECT NUMBER AND NAME W9110 Nano-Composite Hard-Coat for Aircraft Coatings							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Other in-house less than 1.0M	VARIOUS	VARIOUS				0.250	03/02				0.250		
Subtotal Support						0.250					0.250		
Remarks:													
Admin/Test Coordination	SS/CPFF	Concurrent Technol Corp				0.050	03/02				0.050	0.050	
Subtotal T&E						0.050					0.050	0.050	
Remarks:													
Subtotal Management													
Remarks:													
Total Cost						1.338					1.338	1.338	
Remarks:													

R-1 SHOPPING LIST - Item No. 190