

**UNCLASSIFIED**

**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**

**(U) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W0601 Common Ground Equipment	5,513	4,088	3,259	3,410	3,524	3,586	3,720	CONT.	CONT.
W0852 Consolidated Automated Support System (CASS)	8,421	8,523	7,974	8,614	8,754	8,190	8,241	CONT.	CONT.
W1041 Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP)	1,636	894	747	641	640	653	675	CONT.	CONT.
W1355 Aircraft Engine CIP	42,704*	39,495	39,038	38,827	38,593	38,361	38,382	CONT.	CONT.
<b>TOTAL</b>	<b>58,274</b>	<b>53,000</b>	<b>51,018</b>	<b>51,492</b>	<b>51,511</b>	<b>50,790</b>	<b>51,018</b>	<b>CONT.</b>	<b>CONT.</b>

Quantity of RDT&E Articles: Not Applicable

\*The FY 1999 budget reflects a \$2,000 Congressional add for Eddy Current Sensors (executed under project W2663), which has been revised by \$64K for Congressional undistributed adjustments.

(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 all aircraft. CASS develops standardized Automated Test Equipment (ATE) with computer assisted, multi-function capabilities to support the maintenance of aircraft subsystems and missiles. 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. Aircraft Engine CIP develops reliability and maintainability (R&M) and safety enhancements for in-service Navy aircraft engines, transmission, propellers, starters, auxiliary power units, electrical generating systems, fuel systems, and fuels and lubricants.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing for upgrade of existing operational systems.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W0601

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: Common Ground Equipment

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
<b>W0601 COMMON GROUND EQUIPMENT</b>									
<b>TOTAL</b>	5,513	4,088	3,259	3,410	3,524	3,586	3,720	CONT	CONT

Quantity of RDT&E Articles: Not Applicable

(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 1999 ACCOMPLISHMENTS:

- (U) (\$2,546) Continued Advanced Boresight Equipment (ABE) development/LRIP program.
- (U) (\$ 563) Continued development of Joint Service Electronic Combat Tester (JSECT).
- (U) (\$ 530) Continued development of USAF Next Generation Munitions Handler (NGMH).
- (U) (\$ 132) Completed development of Automated Engine Turning Tool.
- (U) (\$1,562) Initiated development of the Joint Engine Test Initiative (JETI).
- (U) (\$ 180) Completed testing of Flight Line Electrical Distribution System (FLEDS) and Heat, Gun Programs.

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**PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**

**PROJECT NUMBER: W0601  
PROJECT TITLE: Common Ground Equipment**

**2. FY 2000 PLAN:**

- (U) (\$ 271) Continue ABE development LRIP program.
- (U) (\$ 266) Continue development of USAF NGMH.
- (U) (\$ 554) Complete JSECT.
- (U) (\$2,997) Continue development of JETI

**3. FY 2001 PLAN:**

- (U) (\$ 380) Continue ABE program.
- (U) (\$ 495) Continue NGMH program.
- (U) (\$1,484) Complete JETI program.
- (U) (\$ 300) Continue new Aircraft Axle Jack Program.
- (U) (\$ 200) Initiate Aviator Breathing Oxygen (ABO) Program.
- (U) (\$ 200) Initiate Composite Material Inspection program.
- (U) (\$ 200) Initiate Non-Destructive Inspection (NDI) Ultrasonics program.

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**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205633N**  
**PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**

**PROJECT NUMBER: W0601**  
**PROJECT TITLE: Common Ground Equipment**

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	6,141	4,110	3,969
(U) Appropriated Value:	6,341	4,110	
(U) Adjustments from President's Budget	(628)	(22)	(710)
(U) FY 2001 President's Budget Submit:	5,513	4,088	3,259

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY1999 reflects a \$599 thousand decrease for reprioritization of requirements within the Navy and a \$29 thousand decrease for revised economic assumptions. FY 2000 reflects a \$22 thousand decrease for an Across-the-Board Congressional rescission. FY 2001 reflects a \$666 thousand decrease for reprioritization of requirements within the Navy, a \$57 thousand decrease for Strategic Sourcing Plan Savings, and a \$29 thousand decrease for revised economic assumptions offset by a \$42 thousand increase for Military and Civilian Pay.

(U) Schedule: The FY 1999 contract for the Advanced Boresight Program slipped due to the receipt of only one bid. Additional contractual steps were taken to ensure contract stability; however, the T&E timeframe will be compressed with no affect to the projected milestones. The FY2001 to Complete for Next Generation Munitions Handler was erroneously stated as 12/01(MSIII), which should have been 12/05(MSIII) as Milestone III begins sometime in FY2004.

(U) Technical: Not applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

<u>Appn</u>	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Budget</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>
(U) APN-7 (47C2)	101,984	139,450	103,100	117,353	115,498	129,335	202,170	Cont
(U) O&MN	2,970	4,600	4,885	4,954	5,028	4,808	4,940	Cont

Related RDT&E: (U) Not Applicable

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PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W0601

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: 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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>	<u>To Complete</u>
(U) Program Milestones				
Automated Engine Turning Tool		1/00(MSIII)		
Advanced Boresight Program PM				12/01(MSIII)
Next Generation Munitions Handler				12/05(MSIII)
FLEDS	9/99(DT)			
(U) Engineering Milestones				
Advanced Boresight Program	8/99 (CDR)			
(U) T&E Milestones				
Automated Engine Turning Tool	2/99 (OT)			
(U) Contract Milestones				
Advanced Boresight Program	4/99 (Contract Award)			
Joint Engine Test Initiative	8/99 (Contract Award)	9/00(MSIII)		

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W0601

PROJECT TITLE: Common Ground Equipment

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Hardware Development	C/FP	AAI Corp, Cockeysville, MD	2,760	4,000	1/99					0	6,760	6,760
	FFP	RACAL San Antonio, TX				2,997	2/00				2,997	2,997
Miscellaneous	Various	Various	10,442	1,513	11/98					Cont	Cont	
<b>Subtotal Hardware Development</b>			<b>13,202</b>	<b>5,513</b>		<b>2,997</b>				<b>Cont</b>	<b>Cont</b>	
<b>Remarks:</b>												
Miscellaneous Support	Various	Various				1,091	1/00	2,759	1/01	Cont	Cont	
<b>Subtotal Support</b>			<b>0</b>	<b>0</b>		<b>1,091</b>		<b>2,759</b>		<b>Cont</b>	<b>Cont</b>	
<b>Remarks:</b>												
Miscellaneous Test & Evaluation	Various	Various						500		Cont	Cont	
<b>Subtotal Test &amp; Evaluation</b>			<b>0</b>	<b>0</b>		<b>0</b>		<b>500</b>		<b>Cont</b>	<b>Cont</b>	
<b>Remarks:</b>												
<b>Subtotal Management</b>			<b>0</b>	<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>	
<b>Remarks:</b>												
<b>Total Cost</b>			<b>13,202</b>	<b>5,513</b>		<b>4,088</b>		<b>3,259</b>		<b>Cont</b>	<b>Cont</b>	

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W0852  
PROJECT TITLE: Consolidated Automated Support System

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
<b>W0852 Consolidated Automated Support System</b>									
<b>TOTAL</b>	<b>8,421</b>	<b>8,523</b>	<b>7,974</b>	<b>8,614</b>	<b>8,754</b>	<b>8,190</b>	<b>8,241</b>	<b>Cont</b>	<b>Cont</b>

Quantity of RDT&E Articles: Not Applicable

(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 standardization; (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 1999 ACCOMPLISHMENTS:

- (U) (\$1,000) Continued development of DOD Automated Test System (ATS) standard interfaces and architectures .
- (U) (\$1,377) Continued development of A Board Base Environmental for Test (ABBET) standards instrument control software.
- (U) (\$1,044) Continued CASS station upgrades to include tunable lasers and wide-band focal plan arrays.
- (U) (\$4,000) Continued development of instrument control upgrades and virtual instruments (RT CASS).
- (U) (\$1,000) Continued development of advanced digital/video process.

2. FY 2000 PLAN:

- (U) (\$ 563) Continue development of DOD ATS standard interfaces and architectures. (NXTEST)
- (U) (\$ 177) Continue development of ABBET standards instrument control software.
- (U) (\$ 406) Continue CASS station upgrades to include tunable lasers.

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PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W0852  
PROJECT TITLE: Consolidated Automated Support System

2. FY 2000 PLAN: (CONT)

- (U) (\$6,919) Continue development of instrument control upgrades and virtual instruments (RT CASS).
- (U) (\$ 458) Continue development of advanced digital/video process.

3. FY 2001 PLAN:

- (U) (\$7,000) Continue development of instrument control upgrades and virtual instruments (RT CASS).
- (U) (\$ 974) Continue CASS station upgrades to include tunable lasers.

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 Presidents Budget:	8,475	8,570	8,819
(U) Appropriated Value:	8,862	8,570	
(U) Adjustments from Presidents Budget:	(54)	(47)	(845)
(U) FY 2001 President's Budget Submit:	8,421	8,523	7,974

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PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W0852  
PROJECT TITLE: Consolidated Automated Support System

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 reflects a \$14 thousand decrease for reprioritization of requirements within the Navy and a \$40 thousand decrease for revised economic assumptions. FY2000 reflects a \$47 thousand decrease for an Across-the-Board Congressional rescission. FY2001 reflects a \$787 thousand reduction for reprioritization of requirements within the Navy and a \$58 thousand decrease for revised economic assumptions.

(U) Schedule: The FY1999 RTCASS contract was awarded April 1999 and an option was exercised November 1999. There will be no effect to the projected milestones.

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To
	<u>Actual</u>	<u>Budget</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>
(U) APN-7 (47C2)	99,347	95,886	121,695	122,889	123,104	116,846	62,090	Cont

Related RDT&E :

(U) N/A

(U) D. ACQUISITION STRATEGY: The strategy 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.

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**PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**

**PROJECT NUMBER: W0852  
PROJECT TITLE: Consolidated Automated Support  
System**

**(U) E. SCHEDULE PROFILE**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>To Complete</u>
(U) Program Milestones RTCASS				N/A
(U) Engineering Milestones RTCASS	6/99(FDR)			
(U) T&E Milestones RTCASS				
(U) Contract Milestones RTCASS	4/99 Contract Award	11/99 Contract Option		

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W0852

PROJECT TITLE: Consolidated Automated Support System

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>
Pre-Planned Product Improvement (P3I)	FPI	Various	835,000							Cont	Cont
P3I	FPI	LMC	12,234	4,000	2/99	6,919	11/99	7,000	1/01	Cont	Cont
P3I	WX	NAWC-AD-LKE	15,539	3,019	12/98	672	12/99	780	12/00	Cont	Cont
P3I	WX	NAWC-AD-PAX	510,200	852	12/98	154	12/99	194	12/00	Cont	Cont
P3I	WX	Various		270	12/98						
<b>Subtotal Product Development</b>			<b>1,372,973</b>	<b>8141</b>		<b>7,745</b>		<b>7,794</b>		<b>Cont</b>	<b>Cont</b>
Misc	Various	Various		280	1/99	778	1/00			Cont	Cont
<b>Subtotal Support</b>				<b>280</b>		<b>778</b>		<b>0</b>		<b>Cont</b>	<b>Cont</b>
<b>Remarks:</b>											
<b>Subtotal Test &amp; Evaluation</b>			<b>0</b>	<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>
<b>Remarks:</b>											
<b>Subtotal Management</b>			<b>0</b>	<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>
<b>Remarks:</b>											
<b>Total Cost</b>			<b>1,372,973</b>	<b>8,421</b>		<b>8,523</b>		<b>7,974</b>		<b>Cont</b>	<b>Cont</b>

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**DATE: FEBRUARY 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205633N**

**PROJECT NUMBER: W1041**

**PROGRAM ELEMENT TITLE: AVIATION IMPROVMENTS**

**PROJECT TITLE: AIRCRAFT EQUIPMENT  
RELIABILITY /MAINTAINABILITY IMPROVEMENT  
PROGRAM (AERMIP)**

**(U) COST: (Dollars in Thousands)**

<b><u>Project Number &amp; Title</u></b>	<b><u>FY 1999 Actual</u></b>	<b><u>FY 2000 Budget</u></b>	<b><u>FY 2001 Estimate</u></b>	<b><u>FY 2002 Estimate</u></b>	<b><u>FY 2003 Estimate</u></b>	<b><u>FY 2004 Estimate</u></b>	<b><u>FY 2005 Estimate</u></b>	<b><u>To Complete</u></b>	<b><u>Total Program</u></b>
W1041 (AERMIP)	1,636	894	747	641	640	653	675	CONT	CONT
<b>TOTAL</b>	<b>1,636</b>	<b>894</b>	<b>747</b>	<b>641</b>	<b>640</b>	<b>653</b>	<b>675</b>	<b>CONT</b>	<b>CONT</b>

Quantity of RDT&E Articles: Not Applicable

(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, and 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 1999 ACCOMPLISHMENTS:

- (U) (\$1,636) Completed E2/C2 Cowling Latch. Received approval to use SKYFLEX on the H60 and F18 aircraft. Continued with SKYFLEX evaluation on the H46, H53, E2/C2, C130, AV-8B, T45, EA6B and F-14, Multi-Place Life Raft Improvement Program, Airborne Air Removal Device program (F-14 application). Extended Replacement Attitude Heading Reference System (RAHRS) application to the EA-6B/E-2C. Initiated MD-1 Gyroscope improvement program. Investigated high value payback return on investment candidates.

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BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVMENTS

PROJECT NUMBER: W1041

PROJECT TITLE: AIRCRAFT EQUIPMENT  
RELIABILITY /MAINTAINABILITY IMPROVEMENT  
PROGRAM (AERMIP)

2. FY 2000 PLAN:

- (U) (\$894) Complete multi-platform application of SKYFLEX with approval for use on all platforms. Complete Airborne Air Removal Device (EA-6B application), and Multi-Place Life Raft Improvement Program. Continue with the extension of application of the RAHRS for the EA-6B/E-2C. Conduct AN/ARC-161 Improvement Program. Investigate high value pay back return on investment candidates.

3. FY 2001 PLAN:

- (U) (\$747) Transition Total Ownership Cost reduction corrosion initiatives and extension of RAHRS application for the EA-6B/E-2C. Initiate the replacement Inner Communication System (ICS) program. Investigate high value return on investment candidates and transition of TOC reduction initiatives.

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	1,315	899	769
(U) Appropriated Value:	1,351	899	
(U) Adjustments from President's Budget:	+321	-5	-22
(U) FY 2001 President's Budget Submit:	1,636	894	747

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**PROGRAM ELEMENT: 0205633N**

**PROGRAM ELEMENT TITLE: AVIATION IMPROVMENTS**

**PROJECT NUMBER: W1041**

**PROJECT TITLE: AIRCRAFT EQUIPMENT  
RELIABILITY /MAINTAINABILITY IMPROVEMENT  
PROGRAM (AERMIP)**

**CHANGE SUMMARY EXPLANATION:**

(U) Funding: The FY 1999 net increase of \$321 thousand reflects an increase of \$204 thousand for the fleet engineering team and an increase of \$132 thousand for Laser Eye offset by a decrease of \$6 thousand for inflation savings, a decrease of \$6 thousand for Small Business Innovative Research (SBIR) assessments, and a decrease of \$3 thousand for payment of lapsed liability contracts. The FY 2000 decrease reflects a \$5 thousand decrease for an Across-the Board rescission. The FY 2001 net decrease of \$22 thousand reflects a decrease of \$16 thousand for Aircraft Maintenance Work, a decrease of \$3 thousand for minor economic adjustments, a decrease of \$2 thousand for reprioritization of requirements within the Navy, a decrease of \$6 thousand for revised economic adjustments, a decrease of \$5 thousand for Strategic Sourcing Plan savings offset by an increase of \$10 thousand for Navy Working Capital Fund (NWCF) adjustments.

(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

**R-1 Item No. 172  
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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205633N**

**PROJECT NUMBER: W1355**

**PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**

**PROJECT TITLE: AIRCRAFT ENGINE CIP**

**(U ) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
<b>W1355 Aircraft Engine CIP</b>									
<b>TOTAL</b>	<b>42,704*</b>	<b>39,495</b>	<b>39,038</b>	<b>38,827</b>	<b>38,593</b>	<b>38,361</b>	<b>38,382</b>	<b>CONT.</b>	<b>CONT.</b>

Quantity of RDT&E Articles: Not applicable

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

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$38,071) Platform-specific efforts.
- T56 engine (P-3, E-2, C-2, C-130) Digital Engine Test Cart/Engine Analyzer Unit (DETC/EAU) flight test completed, Series II/IV Engine tests completed, Series IV Cost Reduction Initiatives identified, Series III module bridge contract successful.
- Propeller Completed first series of P-3 full scale blade fatigue specimens, submitted ECP for C-130 dual-bearing prop governor, and completed phase I Helicopter Integrated Prognostics Support System(HIPSS) test, feasible for P-3 and C-130 applications.
- S-3 Safety related T5 amplifier redesign and qualification testing completed. Completed lubrication system hardware improvements qualification testing. Completed safety related High Pressure Turbine Life (HPT) limit analysis and implementation. Started safety related Low Pressure Turbine (LPT) life limit analysis and implementation. Completed safety related Silverless HPT configuration development., Completed safety related fan disk titanium hard alpha risk assessment.
- F/A-18C/D Identified root cause of 1<sup>st</sup> Stage Fan blade cracking/failure problem and developed control schedule changes to fix this safety issue. Developed Improved Oil Pressure Transmitter Bracket to eliminate false oil pressure cautions, a safety issue. Developed Main Fuel Control Ratio Piston redesign to eliminate Engine Rollback/Flameout problem that was a safety issue. Developed Improved Handling & Maintenance Procedures to Reduce Engine Removals for High Oil Consumption.
- F-14B/D Completed Accelerated Mission Endurance Testing on seven reliability improvement design changes as well as JP8 +100 fuel. Completed Age Exploration (AE) of high time Main Engine Controls (MEC), AE program resulted in a 50% increase in MEC life limit. Collected and processed data from over 600 F-14B and F-14D flights for update of F-14B/D mission analysis and F110-GE-400 engine life limits. Completed High Pressure Turbine (HPT) Forward Shaft rework qualification, which allows HPT shaft to be reworked vice thrown away at its scheduled life limit. Completed T4B Pyrometer redesign.
- Mature Aircraft (EA-6B, T-2) Completed disassembly and evaluation of test engine. Performed Low Pressure Compressor analysis for Stall Improvements. Developed Turbine Brush Seals for evaluation in FY00 Test Engine. Completed verification of new design Turbine Exhaust Case Power Plant Change.
- H-2/H-60 Reduced H-60 power loss and flameouts, a critical safety issue. Analyzed and implemented new life management issues affecting safety and affordability. Identified source of Power Take-off (PT) Shaft Rubs causing high rejection rate. Improved diagnostics and troubleshooting capability. Reduced rejection of serviceable equipment for the top 2 engine level degraders.
- AV-8B Completed design effort and qualification tests for new Inlet Guide Vane Control System (IGVCS), a safety related problem that has led to aircraft mishaps. Completed engineering analyses and risk assessment of multiple quality deficient engine components that failed in the Fleet including Fuel Metering Unit relay shaft and intermediate cause bearing housings, all safety related issues. Acquired over 700-mission profile tapes to analyze data for life management of critical engine components. Completed development of Phase I software for engine monitoring system upgrade.

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PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: AIRCRAFT ENGINE CIP

1. FY 1999 ACCOMPLISHMENTS: (CONT)

- H-53/H-46/H-3 Data reduction program delivered and installed. Reworked Power Take-off alternator conduit seal joint issue. Updated all rotating parts lives, a safety issue. Completed Erosion resistant Airfoil testing. Redesigned safety Anti-Leak check valve Interim Power Plant Change (IPPC).
- H-1 Improved ignition cable assembly, improved No. 3 Bearing Pressure Oil Tube Assembly, and improved Air Inlet Screen. Re-established the Component Improvement Program with Pratt and Witney Canada.
- T-45 Conducted prototype testing for solutions to engine surges, a critical safety issue. Developed new test cell thrust measurement methodology. Submitted Recommended Resdesign for compressor High Cycle Fatigue (HCF) failures, a safety issue. Conducted test and analysis to support life extension for most expensive parts (Low Pressure Turbine Disks, Combustor Cases, Turbine Shafts).
- V-22 Completed brush seal backdrive vendor study. Started AE1107C Life Management Master Plan. Vibration Structural Life Engine Diagnostics (VSLED) and Aircraft Maintenance Engineering Ground Station (AMEGS) program support. Started the Propeller Gearbox (PRGB) Non-magnetic detector program to correct a safety issue.
- F/A-18E/F. Investigated compressor blisk tip cracking, engine stalls and stator fatigue. Instrumented compressor engine test. Gathered data from test to be used in redesign efforts. Developed Full Authorized Digital Electronic Control (FADEC) Software re-programming and developed interim solutions for blisk tip cracking and stall.
- (U) (\$4,633) Multi-Platform Product Support Published NAVAIRINST 10350.4A which provides technical information and guidance to the fleet on the handling and use of propulsion lubricants. Published service problem investigation reports. Completed full MIL-PRF-23699F qualification testing of one new High Thermal Stability Oil and one new Corrosion Inhibited candidate formulation. Completed requalification testing of one Standard grade oil. Completed revisions to SAE aviation piston engine oil standards J1899 and J1966 and the associated military Qualification Products Lists. Provided operational resolution of the AV-8B, F402-RR-406 fuel incompatibility problem. Reported on the preliminary investigation into the shipboard implementation of the +100 fuel thermal stability-improving additive. Conducted a shipboard evaluation of a +100 additive detection kit. Held NATOPS conference and published the revised Aircraft Refueling Handbook. Investigated and resolved over 40 fuel related fleet service problems. Developed modeling and simulation capabilities, acquired tools and training to model and simulate fuel systems, initiated (V-22) fuel system model development and developed improved engine control simulation capability. Re-designed, reviewed, and evaluated TH-6B helicopter fuel system quantity indication system. Advanced the use of aircraft monitoring systems to assess and monitor engine health and track engine parts lives using actual engine data in order to maximize parts life, system reliability, maintainability, and safety.

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2. FY 2000 PLAN:

- (U) (\$35,150) Platform-specific efforts.
- T56 engine (P-3, E-2, C-2, C-130) 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 propeller safety improvement program, initiate pump housing improvement, perform Hub Internal Supply System development, eliminate starter failures, continue generator improvement program to triple durability.
- S-3 Establish and implement an engineering plan to improve TF34 reliability, perform analysis to obtain better performance from existing hardware, redesign low reliability parts, conduct control system reliability and maintainability analysis, validate and implement recommended part life changes.
- F/A-18C/D Identify obsolescence problems, continue efforts on aft cooling plate, low pressure turbine nozzle and fan stage 3 shroud redesigns. Continue life management issues including the fleet leader program, engine analysis studies, and improved analytical models, analyze engine performance data and update mission analysis.
- Mature Aircraft Address the top readiness degraders and Aviation Depot Logistic Repair (AVDLR) costs; implement efforts on the J52 engine (EA-6B) ASMET test, correct deficiencies in #3 hub, continue to study and implement solutions to "tired iron" issues and future obsolescence problems.
- H-2/H-60 Implement I-level screening techniques for the Digital Electronic Control Unit (DECU) and Hydro-Mechanical units, 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.
- AV-8B Address 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 Continue efforts on the top cause for engine removals; complete transition of program to reliability-centered maintenance; implement goals at depot level to improve compressor performance and engine power, resolve oil consumption and leakage problems, and improve on wing times.
- H-1 Address top safety concerns as ranked by the Operational Advisory Group (OAG) and System Safety Working Group, update Navy maintenance manuals, continue to improve time-between-overhaul and reduce impact of high-time parts, continue improvements on tail rotor drive system.
- T-45 Complete four year engine surge recovery program, address platform safety, increase predicted part life confidence, provide mission profile updates and life cycle management.
- F-14A Perform minimal level of sustaining engineering to address safety-of-flight issues.
- F-14B/D Address extension of component life and the reduction of maintenance hours, improve propulsion system safety through an active life management program for critical rotating components, reduce the engine Non-recoverable In-Flight Shutdown Rate by 75% by 2003, reduce the propulsion system related mission abort rate by 50% by 2003.
- F/A-18E/F and V-22 Continue initiation of CIP programs addressing propulsion systems such as electrical and fuel systems not covered by Power by the Hour programs and other support programs. Address durability improvements identified during qualification testing, continue the life cycle management program, continue "lead the fleet" testing to identify potential deficiencies prior to manifestation in fleet.

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PROJECT TITLE: AIRCRAFT ENGINE CIP

2. FY 2000 PLAN: (CONT)

- (U) (\$4,345) 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.

3. FY 2001 PLAN:

- (U) (\$34,828) Platform-specific efforts.
  - T56 engine (P-3, E-2, C-2, C-130) Begin and implement 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 Begin incorporation of improved blade heaters. Begin development of improved propeller control system.
  - S-3 Complete new fan blade design. Complete safety related fan High Pressure Compressor (HPC) life limit analysis. Complete Main Fuel Control (MFC) durability investigation. Perform analyses on commercial hardware incorporation analyses. Continue validation and implementation on recommended part life changes.
  - F/A-18C/D Identify obsolescence problems, continue efforts on bushing, aft cooling plate, low pressure turbine nozzle and bolted dome combustor redesign efforts. Continue life management issues including the fleet leader program, engine analysis studies, and improved analytical models, analyze engine performance data and update mission 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 "tired iron" issues and future obsolescence problems. Begin redesign of diffuser case for increased life.
  - H-2/H-60 Complete integrating of the improved Digital Electronic Control Unit (DECU) to the H-60 fleet. Complete implementation of I-level screening techniques for the DECU and Hydro-Mechanical units, 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.

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3. FY 2001 PLAN: (CONT)

- AV-8B Complete design efforts associated with the exhaust duct cracking, and failure of the Low Pressure Compressor (LPC) and HPT blade cracking and shaft sulfidation. Complete Shell Deer Park fuel burner rig testing to eliminate all risk associated with fuel incompatibility in the F402 engines. Address 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 Start Bleed Valve redesign. Continue efforts on the top cause for engine removals; complete transition of program to reliability-centered maintenance; implement goals at depot level to improve compressor performance and engine power, resolve oil consumption and leakage problems, and improve on wing times.
- 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. Continue improvement program to the Bleed Valve, T5 Harness, Gas Generator Case Diffuser Inlet, and Compressor Stub Shaft. Initiate development of environmentally friendly repairs such as High Velocity OXY fuel coatings to replace chrome and nickel plate repairs.
- T-45 Continue investigation of engine vibration problems to resolve safety issue. Address platform safety, increase predicted part life confidence, provide mission profile updates and life cycle management. Continue Critical Parts Life management to ensure no overfly of parts, continue life management to double most expensive parts life, and address obsolescence issues.
- F-14B/D Complete final life limit updates for F110-GE-400 engine. Complete High Pressure Compressor Spool life improve redesign. 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, reduce the engine Non-recoverable In-Flight Shutdown Rate by 75% by 2003, reduce the propulsion system related mission abort rate by 50% by 2003.
- F/A-E/F Continue analysis of new design using tools validated by test data and fatigue resolutions. Conduct instrumented engine test for tip cracks, stall, and stator. Begin Anti-Ice System Reliability improvements. Investigate afterburner spraybar flex fuel line durability safety issues. . Address durability improvements identified during qualification testing, continue the life cycle management program, continue "lead the fleet" testing to identify potential deficiencies prior to manifestation in fleet.
- V-22 Initiate redesign of Non-magnetic Debris Detector a safety item. Initiate redesign of Integral Spindle Drive Shaft Address durability improvements identified during qualification testing. Continue the life cycle management program and "lead the fleet" testing to identify potential deficiencies prior to manifestation in fleet.
- (U) (\$4,210) 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.

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(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	46,167	39,714	47,526
(U) Appropriated Value:	47,402	39,714	
(U) Adjustments from President's Budget:	-3,463	-219	-8,488
(U) FY 2001 President's Budget Submit:	42,704	39,495	39,038

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 net decrease of \$3,463 thousand reflects a decrease of \$895 thousand for Small Business Innovative Research (SBIR) assessments, a decrease of \$1,116 thousand for Smart Work/TOC Initiatives, a decrease of \$1,322 thousand for a reprioritization of requirements within the Navy, and a decrease of \$214 thousand for Inflation Savings offset by an increase of \$84 thousand for minor economic adjustments. The FY 2000 decrease reflects a \$219 thousand decrease for an Across-the-Board Congressional rescission. The FY 2001 net decrease of \$8,488 thousand reflects a decrease of \$144 thousand for minor economic adjustments, a decrease of \$365 thousand for Strategic Sourcing Plan savings, a decrease of \$275 thousand for revised economic assumptions, and a decrease of \$7902 thousand for reprioritization of requirements within the Navy offset by an increase of \$137 thousand for Navy Working Capital Fund (NWCF) adjustments and an increase of \$61 thousand for Military and Civilian Pay.

(U) Schedule: Deferment of Lead the Fleet efforts including analytical condition inspections, service evaluations, and threshold sampling. Reduce scope of FY99 H-1 efforts to eliminate analysis of top readiness degraders and high-time parts which support goal of improving time-between-overhaul; defer portion of tail rotor drive system improvements with completion of effort in FY02 versus FY01. F-18 E/F and V-22 CIP efforts to address propulsion system integration issues uncovered during the flight test programs and establish methodologies for core program metrics have been delayed. Impact on Reliability and Maintainability efforts such as deferment of plans for product improvements, designs to increase time on wing, reduce mean time between failure, and reduce operating and support costs.

(U) Technical: Increase aircraft flight safety risk for the F-18 E/F and V-22 during Operational Evaluation. Increase overall production retrofit costs for needed improvements. Cannot expand evaluation and verifications of redesigns due to deferment of efforts and delays and elimination of R&M projects. Cannot fully explore affordable readiness or properly document lessons learned and realize reliability growth.

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

Related RDT&E

(U) P.E. 0203752A (Aircraft Engine CIP Army)

(U) P.E. 0207268F (Aircraft Engine CIP Air Force)

(U) P.E. 0603217N (Aircraft System Advance Tech. Dev.)

(U) D. ACQUISITION STRATEGY: Not applicable

(U) E. SCHEDULE PROFILE: Not Applicable

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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROJECT TITLE: AIRCRAFT

ENGINE CIP

<u>Cost Categories:</u>	<u>Contract Method</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY2001 Cost</u>	<u>FY2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
PRODUCT DEVELOPMENT												
MAJOR EFFORTS (\$1.0M OR MORE)												
F110 Engine Program												
GE F3365797C0016	SS/CPAF	Ohio	8,186	2,200	12/98	2,400	12/99	2,100	12/00	CONT.	CONT.	
Award Fees				(220)		(240)		(210)				
F402 ENGINE PROGRAM												
N0001996C0172 RR	SS/CPAF	BRISTOL ENG	6,153	2,000	1/99	1,805	12/99			CONT.	CONT.	
N0001996C0134 UK	SS/CPFF	BRISTOL ENG	5,497	1,990	1/99	1,750	12/99			CONT.	CONT.	
N0001999C0010	SS/CPFF	BRISTOL ENG	0					3,000	12/00	CONT.	CONT.	
Award Fees				(160)		(144)		(240)				
F404//T58/T64 ENGINE PROGRAM												
N0001998C0007 GE	SS/CPFF	LYNN MA	5,333	8,800	10/98							
TBD	SS/CPFF	LYNN MA	0			7,040	10/99	7,000	11/00	CONT.	CONT.	
J52 ENGINE PROGRAM												
N0001998C0054 P&W	SS/CPFF	FL	1,901	2,010	11/98							
TBD	SS/CPFF	FL	0			2,800	11/99	2,000	12/00	CONT.	CONT.	
T56 ENGINE												
F4160898C0551	SS/CPFF	INDIANA	0	1,670	1/99	1,905	1/00	1,600	2/01	CONT.	CONT.	
F405 ENGINE PROGRAM												
N0001997C0112 RR	SS/CPAF	BRISTOL ENG	1,900							CONT.	CONT.	
N0001999C0010	SS/CPAF	BRISTOL ENG		1,440	1/99	1,204	12/99	2,000	12/00	CONT.	CONT.	
Award Fees				(115)		(96)		(160)				

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<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY2001 Cost</u>	<u>FY2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
F/A 18 E/F PROPULSION PROGRAM N0001998C0007	SS/CPFF	LYNN MA	0	664	3/99	1,401	10/99	680	11/00	CONT.	CONT.	
T700 ENGINE PROGRAM DAAJ0997C0131 GE	SS/CPFF	LYNN MA	1,092	1,000	12/98	1,000	12/99	1,000	1/01	CONT.	CONT.	
TF34 ENGINE PROGRAM F1460895C1461 GE	SS/CPFF	LYNN MA	2,420	700	10/98	720	10/99	600	11/00	CONT.	CONT.	
V22 PROPULSION PROGRAM N0001999G1048	SS/CPFF	LYNN MA	0	1,000	3/99	1,267	12/99	725	12/00	CONT.	CONT.	
PROPS PROGRAM NAVAIR CONTRACT HAM STANDARD	SS/CPFF		0	1,895	11/98	1,500	10/99	1,000	12/00	CONT.	CONT.	
CONTRACTS UNDER \$1.0M . AGGREGATE TOTAL	VARIOUS	VARIOUS	9,159	1,000	10/98	500	10/99	1,107	10/00	CONT.	CONT.	
LAB/FIELD ACTIVITY (\$1.0M OR MORE)	WX	NAWCAD PAX	60,650	13,759	10/98	12,129	10/99	14,276	10/00	CONT.	CONT.	
OTHER IN HOUSE SUPT <\$1.0M	VARIOUS	VARIOUS	11,946	1,014	10/98	780	10/99	750	10/00	CONT.	CONT.	
GFP FUEL MD INCREMENTAL			2,885	460	10/98	350	10/99	300	10/00	CONT.	CONT.	
<b>Subtotal Product Development</b>			<b>117,122</b>	<b>41,602</b>		<b>38,551</b>		<b>38,138</b>		<b>CONT.</b>	<b>CONT.</b>	

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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

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**PROJECT NUMBER: W1355**

**PROJECT TITLE: AIRCRAFT ENGINE CIP**

Remarks  
Percent of award fee that was actually awarded in PY was 97%.

<b>Cost Categories:</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Yrs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>FY2001 Cost</b>	<b>FY2001 Award Date</b>	<b>Cost to Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
SUPPORT												
OTHER IN HOUSE SUPPORT <\$1.0M			1,747	750	10/98	649	10/99	650	10/00	CONT.	CONT.	
<b>Subtotal Support</b>			<b>1,747</b>	<b>750</b>		<b>649</b>		<b>650</b>		<b>CONT.</b>	<b>CONT.</b>	
Remarks												
<b>TEST AND EVALUATION</b>												
OTHER IN HOUSE <\$1.0M												
AGGREGATE TOTAL	VARIOUS	VARIOUS	2,144	150	10/98	100	10/99	150	10/00	CONT.	CONT.	
<b>Subtotal Test &amp; Evaluation</b>			<b>2,144</b>	<b>150</b>		<b>100</b>		<b>150</b>		<b>CONT.</b>	<b>CONT.</b>	
Remarks												
MANAGEMENT												
OTHER IN HOUSE <\$1.0M	VARIOUS	VARIOUS	0	202	10/98	195	10/99	100	10/00	CONT.	CONT.	
<b>Subtotal Management</b>			<b>0</b>	<b>202</b>		<b>195</b>		<b>100</b>		<b>CONT.</b>	<b>CONT.</b>	
Remarks												
<b>Total Cost</b>			<b>121,013</b>	<b>42,704</b>		<b>39,495</b>		<b>39,038</b>		<b>CONT.</b>	<b>CONT.</b>	

**R-1 Item No. 172  
UNCLASSIFIED**