

UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604710N
PROGRAM ELEMENT TITLE: Navy Energy Program

A. (U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0371 Energy Conservation	3,476	5,416	5,531	5,748	5,770	5,880	6,057	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Develop energy-efficient systems and practices for ships, aircraft, and facilities. Resulting energy efficiency gains contribute to fleet sustainability, combat capability (e.g., greater range, time on station), and reduced operating costs. Efforts include fuel use optimization aids for aircraft; existing gas turbine engine efficiency improvements, anti-fouling paints, and air conditioning for ships; and adaptation of renewable/alternative energy technologies to Navy facility needs. Provide engineering development, and test and evaluation support to the companion PE 0603724N Project R0829. As currently funded and planned, the Navy Ship and Aircraft Energy Conservation R&D Program, of which this PE is a part, is estimated to result in energy cost avoidance of \$70M/yr by FY2005.

(U) This program and the companion PE 0603724N Navy Energy Program (ADV), support the achievement of Legislated, White House, Department of Defense (DoD), and Navy Energy Management Goals. They also address direction by the Office of the Secretary of Defense, the Secretary of the Navy, and the Chief of Naval Operations to make up-front investment in technologies that reduce future cost of operation and ownership of the fleet and supporting infrastructure. Navy is TRISERVICE lead for the implementation of renewable/alternative energy systems across DoD.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

R-1 Line Item 120

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, page 1 of 6)

UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program

PROJECT TITLE: Energy Conservation (ENG)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$720) Aircraft: Continued development of a WINDOWS version of Flight Optimization Routines for Energy Management (FOREM) which is being tested and distributed to the fleet for F/A-18A/B/C/D, F-14A/B/D, EA-6B, TA-4J, T-45, AV-8B and P-3C platforms. Monitored P-3 Flight Performance Advisory System (FPAS) contracted development to automate the existing manual system. Provided palmtop portable computers running FOREM to additional Marine squadrons. Initiated joint effort to provide certified FOREM flight performance data to the tactical aircraft mission planning system (TAMPS) program for use in their stand alone flight planner. This program will provide translation of existing FOREM databases and will cost share database development for additional aircraft of mutual interest.
- (U) (\$1,116) Ships: Began full-scale ship trials to determine performance of a DDG-51 retrofit stern flap. Supported test and evaluation (T&E) of new 125 ton air-conditioning plant with optimized impeller/compressor designed to avoid efficiency losses in R114 replacement program. Continued T&E of life cycle management procedures for advanced hull coatings. Conducted panel tests of self-polishing copper/cobiocide paint. Continued to monitor large-scale test applications of other easy release and advanced copper hull paints. Began three high payback/ low cost tasks to improve the installed efficiency of existing fleet gas turbines: reduce air leakage at face and manifold seals, and reduce back-pressure from poor ducting design.
- (U) (\$1,640) Alternative and Renewable Energy Systems: Investigated photovoltaic (PV)/Fuel Cell hybrid power system technology/concepts. Initiated Support and T&E of PV/Diesel hybrid power systems for off-grid applications. Continued development of a high efficiency, low emissions power generation concept. Continued systems engineering support for renewable energy power systems as DoD assigned technical lead.

2. (U) FY 2000 PLAN:

R-1 Line Item 120

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, page 2 of 6)

UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program

PROJECT TITLE: Energy Conservation (ENG)

- (U) (\$850) Aircraft: Complete conversion of FOREM software to WINDOWS format and deliver to C-9, C-130, and C-2. Extend FOREM to additional aircraft such as MV-22, E-6A, F/A-18E/F. To eliminate duplication of effort, provide TAMPS program with FOREM software for requested aircraft classes. Cost share (with the respective platform program managers) contracted efforts to automate the P-3 FPAS (e.g. develop airframe to computer interfaces required to provide fuel flow, external winds and temperature, MACH NO. and altitude); and to rewrite F/A-18C/D FPAS to support F/A-18E/F. Begin FOREM flight performance database development for additional aircraft as a part of the joint program with TAMPS (e.g. S-3B, E-2C, CH-53E).
 - (U) (\$1,296) Ships: Install and complete powering trials for DDG-51 stern flap or wedge/flap retrofit devices to reduce drag. Monitor ship trials of easy release and ablative copper/cobiocide hull coatings; broaden task to include large-scale tests of reduced copper/cobiocide self-polishing paints. Test and evaluate high efficiency air conditioning plants, supporting both R114 replacement program and development efforts for new construction. Develop shipboard Gas Turbine engine mods which reduce air leakage, improve water wash procedures and reduce exhaust back-pressure to improve efficiency and reduce maintenance costs.
 - (U) (\$3,270) Alternative and Renewable Energy Systems: Continue design and T&E of PV/Diesel hybrid power systems for off grid applications. Accelerate development of high efficiency, low emissions, power generation system. T&E advanced PV module technologies for grid support and energy efficient/sustainable building designs. Provide technical support for site-specific technology selection, system design and T&E support for renewable/alternative power systems as assigned DoD technical lead.
3. (U) FY 2001 PLAN:
- (U) (\$880) Aircraft: Continue the P-3C and F/A-18E/F FPAS development programs (jointly funded with the respective platform program managers) to ensure effectiveness of methodologies and displays. Distribute FOREM for WINDOWS to additional aircraft (e.g. F/A-18E/F, MV-22) as testing of software is completed. Maintain responsiveness to Fleet requested enhancements of FOREM and requests for palm-tops. Provide TAMPS program with FOREM data as requested.

R-1 Line Item 120

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, page 3 of 6)

UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program

PROJECT TITLE: Energy Conservation (ENG)

- (U) (\$1,871) Ships: Fabricate, install, and conduct before and after powering trials of the LSD 41/49 stern flap. Assist fleet introduction of hull inspection/cleaning Remote Operated Vehicle. Monitor large-scale tests of advanced hull coatings, including self-polishing reduced copper/cobiocide products. Support high efficiency air-conditioning T&E. Conduct full-scale shipboard evaluation of gas turbine on-line water-wash system.
- (U) (\$2,780) Alternative and Renewable Energy Systems: Continue site specific design and support of PV/Diesel hybrid power systems for off-grid applications. Continue T&E/support of advanced PV module technologies (advanced thin films receptors, multi-junction, building integrated, etc.) for grid connected and energy efficient/sustainable design buildings. Continue T&E of advanced energy storage concepts for PV systems. Continue development of high efficiency, low emissions power generation system. As assigned DoD Technical lead, provide all services with site-specific technology selection, systems design, and T&E support to implement zero emission, renewable/alternative power systems to reduce green house gas emissions.

B. (U) PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	3,530	5,446	5,586
(U) Appropriated Value:		5,446	
(U) Adjustments from PRESBUDG:			
(U) Congressional Rescissions		-30	
(U) SBIR/STTR Adjustment	-37		
(U) Various Rate Adjustments	-16		-55
(U) Execution Adjustments	-1		

R-1 Line Item 120

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, page 4 of 6)

UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program

PROJECT TITLE: Energy Conservation (ENG)

(U) FY 2001 PRESBUDG Budget Submission:	3,476	5,416	5,531
---	-------	-------	-------

(U) CHANGE SUMMARY EXPLANATION:

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) PE 0601153N (Defense Research Sciences)

(U) PE 0602121N (Surface Ship Technology)

(U) PE 0602122N (Aircraft Technology)

(U) PE 0602234N (Materials, Electronics and Computer Technology)

(U) PE 0603712N (Environmental Quality and Logistics Advanced Technology)

(U) PE 0603721N (Environmental Protection)

(U) PE 0603724N (Navy Energy Program (ADV))

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Line Item 120

UNCLASSIFIED

Budget Item Justification
(Exhibit R-2, page 5 of 6)

UNCLASSIFIED

FY 2001 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604710N

PROJECT NUMBER: R0371

PROGRAM ELEMENT TITLE: Navy Energy Program (ENG)

PROJECT TITLE: Energy Conservation (ENG)

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
Engineering Development & Testing	3,476	5,416	5,531

R-1 Line Item 120

OSD/OMB RDT&E PE/Project Cost Breakdown
(Exhibit R-3, page 6 of 6)

UNCLASSIFIED