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United States General Accounting Office
Washington, DC 20548

May 22, 2001

The Honorable James Inhofe
Chairman
The Honorable Daniel Akaka
Ranking Member
Subcommittee on Readiness and Management Support
Committee on Armed Services
United States Senate

Subject: Defense Acquisitions: Navy and Marine Corps Pilot Program Initiatives to Reduce Total Ownership Costs

The cost of operating and supporting the services' weapon systems is absorbing an increasing share of the defense budget and is reducing funds available for buying new systems. As a result, older weapons are being retained in the inventory longer, which further increases their operating and support costs. Operating and support costs include costs for fuel, repair parts, maintenance, and contract and support services, as well as for all civilian and military personnel associated with a weapon system.

The Department of Defense (DOD) has set broad goals for lowering the operating and support costs of both weapon systems in development and those already fielded. The projected life-cycle costs for developmental systems are expected to be 20 to 50 percent less than the systems being replaced. The operating and support costs of fielded systems are expected to be reduced 20 percent by 2005. The Department has established baselines against which the programs can calculate progress and is monitoring progress through quarterly reports.

In April 1998, DOD established an initiative that expanded program managers' responsibilities for designing and producing new weapon systems to include more accountability for the total ownership cost of the system, including its operating and support costs. Under this initiative, each service was to designate 10 programs as pilots to test innovative approaches to reduce total ownership costs, especially operating and support costs.

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Abstract This is the third in a series of reports in response to your request that we evaluate the military services' efforts to reduce weapon systems operating and support costs. We previously reported on Army and Air Force efforts. 1 We reported a lack of accountability and priority in reducing their systems operating and support costs. We recommended that the Army and Air Force develop operating and support cost goals for each weapon system and track progress toward achieving those goals. To complete our evaluation of the military services' operating and support cost reduction efforts, we examined 10 Navy and Marine Corps pilot programs and briefed your staff on the results. This letter summarizes our observations on the Navy and Marine Corps pilot programs and provides, as an enclosure, our briefing slides.		
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Summary of Navy and Marine Corps Operating and Support Cost Reduction Efforts

The Navy and Marine Corps cited a number of initiatives to reduce weapon system operating and support costs. For example, they are using an open architecture design method that reduces the cost of component replacement and changes later in system life. They are also providing contractor incentives to include more operating and support cost saving features in the system's design. In addition, the Navy has other related objectives and initiatives that could significantly reduce operating and support costs. These include reducing manpower requirements, improving the quality of life for sailors, improving the responsiveness of the supply system, and improving performance by improving reliability and reducing maintenance requirements.

Through these and other initiatives, the Navy and Marine Corps have reported progress in reducing operating and support cost in its pilot programs. The table below shows the reported progress of the programs as estimated for fiscal year 2005.

Table 1: Navy and Marine Corps Cost Avoidance/Reduction in Fiscal Year 2005
Dollars in millions

Pilot program	Cost avoidance/reduction fiscal year 2005
Standoff Land Attack Missile Expanded Response	\$3.3
H-60 Helicopter	10.0
Aviation Support Equipment	161.0
EA-6B	15.8
CG-47 Class Aegis Cruiser	62.3
CVN—68 Class Carrier (9 carriers)	57.6
Medium Tactical Vehicle Replacement	20.0
Advanced Amphibious Assault Vehicle	0.3
LPD-17	80.0
Common Ship	91.0

¹ *Defense Acquisitions: Air Force Operating and Support Cost Reductions Need Higher Priority* (GAO/NSIAD-00-165, Aug. 29, 2000) and *Defense Acquisitions: Higher Priority Needed for Army Operating and Support Cost Reduction Efforts* (GAO/NSIAD-00-197, Sept. 29, 2000).

Although each program expects some costs to decline, the Navy and Marine Corps report that costs could decline even further if some challenges were successfully resolved. Similar to our findings in the Army and Air Force, Navy program officials report that operating and support cost reductions do not have the same funding priority as performance or safety issues. Program officials also report that the database used to track operating and support costs could be improved. Officials agreed that focusing attention on operating and support costs through the pilot programs as well as through Navy and Marine Corps policy resulted in incentives to lower costs.

In our previous reports, we recommended that the Army and Air Force develop specific and measurable operating and support cost requirements for each of their weapon systems and track progress in meeting them in the same manner that development and procurement costs are established, tracked, and measured. We believe that the Navy and Marine Corps, like the Army and Air Force, would benefit from early establishment of specific, measurable requirements for each weapon system's operating and support costs and monitoring of progress toward achieving those requirements.

The enclosure to this letter contains the briefing slides that we prepared on the Navy and Marine Corps initiatives to reduce operating and support costs. These briefing slides were reviewed by officials from the Navy, the Marine Corps, and the Office of the Secretary of Defense, and these officials provided oral comments on the technical accuracy as well as tone and clarity of the presentation. We incorporated their comments as appropriate. The officials agreed with our observations noting that readiness was the Navy and Marine Corps first priority.

If you or your staff have any questions on these matters, please call me on (202) 512-4841 or Bill Graveline on (256) 650-1414.

A handwritten signature in black ink, reading "James F. Wiggins". The signature is fluid and cursive, with a large initial "J" and "W".

James F. Wiggins
Director, Acquisition and Sourcing Management

Enclosure

Slide 1



Navy and Marine Corps Initiatives to Reduce Total Ownership Cost

**Briefing to
Subcommittee on Readiness and Management
Support
Senate Armed Services Committee
April 19, 2001**

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Background

- Congress directed DOD to develop a plan to streamline DOD's acquisition organization, workforce, and infrastructure.
 - Each service designated 10 programs to develop innovative approaches to reducing costs.
 - Committee requested GAO evaluate pilot program initiatives and results.

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Background

- GAO Reports and Briefings
 - *Air Force Operating and Support Cost Reductions Need Higher Priority* (NSIAD-00-165); *Higher Priority Needed for Army Operating and Support Cost Reduction Efforts* (NSIAD-00-197); Briefings to the Committee, October and December 2000.
 - Air Force and Army do not establish operating and support cost goals and manage to them.
 - Air Force and Army have limited visibility of operating and support costs.
 - We recommended that the Air Force and Army develop operating and support cost goals and track progress toward achieving those goals.

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Key Questions

- What initiatives have the Navy and Marine Corps proposed in their pilot programs to reduce total ownership cost?
- What results have they obtained as a result of the initiatives?
 - What factors limit operating and support cost reductions?

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Navy and Marine Corps Pilot Programs

- Fielded Systems
 - Standoff Land Attack Missile--Expanded Response
 - H-60 Helicopter
 - Aviation Support Equipment
 - EA-6B
 - CG-47 Class Aegis Cruiser
 - CVN 68 Class Carrier
 - Medium Tactical Vehicle Replacement

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Navy and Marine Corps Pilot Programs

- Developmental Systems
 - Advanced Amphibious Assault Vehicle
 - LPD-17
- Other
 - Common Ship
 - Not one specific system, but a program to identify initiatives that could be used on a variety of ships.

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Navy and Marine Corps Common Themes

- Pilots have different initiatives, but the initiatives had the following themes in common:
 - Reduce total cost of ownership
 - Reduce manpower requirements
 - Improve shipboard quality of life
 - Improve responsiveness of the supply system
 - Improve performance
 - Reduce cyclical maintenance requirements
 - Improve reliability

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What Initiatives Have the Pilot Programs Taken?

- Fielded systems
 - Design: some changes can be made when systems are available during overhaul or other times.
 - Stern flap for the CG-47
 - Logistics improvements
 - Diagnostic equipment improvements
 - Performance-based logistics contracts
 - Rework maintenance requirements
 - Repair or replace parts during regularly scheduled maintenance, eliminate mid-life rebuilds
 - Substitute components that need less maintenance

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What Initiatives Have the Pilot Programs Taken?

- Developmental systems: consider opportunities to reduce cost of ownership while designing the system.
 - Advanced Amphibious Assault Vehicle: special contract provisions to encourage contractor to reduce operating and support costs through design.
 - LPD-17: corrosion-resistant materials
- Both fielded and developmental systems
 - Buy smart
 - Producibility studies
 - Ordering sufficient quantities for efficient production

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What Results Have the Pilots Obtained?

- DOD goal is to reduce costs by 20 percent in 2005.
 - Operating and support costs for fielded systems; life-cycle costs for developmental systems
- According to DOD, 20 percent reduction is an overall goal, not based on an analysis of what is possible in each program.
- Baseline for programs is established.
 - All programs report some progress toward reducing ownership costs in fiscal year 2005.

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What Barriers Do Pilots Report?

- Funding Priority
 - NAVSEA and NAVAIR tax programs and reinvest the funds in projects, but funds can be and have been used for other purposes.
 - Small Business Innovation Research Funds applied for and awarded to a number of programs--one-half of the awards are for projects that reduce ownership cost.
 - For ships, funding is programmed for mid-life overhaul, but some improvements could be made at other times.
 - Low Quantity/High Procurement Unit Cost paradigm.
- Data Reliability
 - Data for operating and support costs not complete.

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Individual Program Initiatives

- Standoff Land Attack Missile-Expanded Response
 - Missile total ownership cost is not typical.
 - Production is over 52 percent; O&S is 23 percent
- Initiatives
 - Design--substantially reduced part count.
 - Production--reduced missile lead time to 52 weeks, establish more efficient production rate.
 - Operating and support cost--reduced data link failure rate by 90 percent through modification
- Results-- savings/cost avoidance in 2005 of \$3.3 million or about 29 percent.

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Individual Program Initiatives

- H-60 Helicopter Initiatives
 - Implement Helicopter Master Plan--decrease number of configurations
 - Use remanufacture to increase reliability, maintainability, and safety and decrease required maintenance.
 - Improve repair response time through performance based logistics support.
 - Implement acquisition reforms such as retaining savings, 2-year funds, provide operating and maintenance funds once a year.
- Results--for H-60 alone--about 3 percent or about \$10 million. Full implementation of Helicopter Master Plan could yield 20.3 percent or \$156 million in fiscal year 2005.

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Individual Program Initiatives

- Aviation Support Equipment Initiatives
 - Replace legacy support equipment with the Consolidated Automated Support system
 - 25 equipment types to 1; reduced personnel from 105 to 54, reduced space on the carrier from 2700 to 1900 square feet, 624 publications reduced to 4 CDs
 - Replace or upgrade common ground support equipment
 - Implement Reliability Centered Maintenance Analysis on support equipment.
- Results: savings/cost avoidance of \$161million in fiscal year 2005--41 percent reduction.

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Individual Program Initiatives

- EA-6B Initiatives
 - Reliability improvements to engine and navigation
 - Replace components of weapons
 - Reduce number of transmitters
 - Upgrade aircraft
 - Reduce configurations from 4 to 2 in fiscal year 2007
 - Improve maintenance flow
 - Use Integrated Maintenance Concept to define revised intervals and maintenance levels for preventative maintenance.
- Results: Savings/cost avoidance estimated at \$15.8 million--8.63 percent in fiscal year 2005.

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Individual Program Initiatives

- CG-47 Class Aegis Cruiser Initiatives
 - Integrated Ship Controls--automation of ship controls
 - All Electric removes gas turbine generator, replaces with all electric heaters and desalinators.
 - Stern Flap reduces drag and fuel consumption.
 - Wireless sensors network reduces crew workload by sensing changes in environment, personnel, structure and machinery.
 - Advanced Food Service introduces commercial food preparation techniques, equipment
- Results: Reduced crew workload, \$62.3 million savings/cost avoidance. Goal is \$261million in fiscal year 2005.

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Individual Program Initiatives

- CVN--68 Class Carrier Initiatives
 - Use ongoing programs such as Engineering for Reduced Maintenance, Top Management Attention, Technology Back Fit, Smart Carrier to develop initiatives. Maintenance cost and crew workload targeted
 - advanced paints and materials
 - commercial-off-the-shelf incinerator
 - Improved ACE Stanchion System
 - Improved Processes--dry-docking every 12 years versus every 6 years, cumbersome work practices analysis
- Results: Estimated savings/cost avoidance of \$57.6 million in 2005 for nine carriers.

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Individual Program Initiatives

- Medium Tactical Vehicle Replacement
 - Initiatives
 - Design--better fuel usage, independent suspension, on-board diagnostics, eliminate mid-life rebuild
 - Buy at an efficient rate--7,000 trucks in 5 years
 - Contractor logistics support
 - Training simulators, maintenance simulators
 - Results: Savings/cost avoidance of \$20 million in fiscal year 2005.

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Individual Program Initiatives

- Advanced Amphibious Assault Vehicle Initiatives
 - Operating and support cost considered in design: contract provision allows contractor to recoup costs for developing initiatives that reduce operating costs
 - Employ open architecture, such as on 30-millimeter gun
 - Transmission, NBC filters, suspension, fire control computer processor.
 - Established threshold and objective baselines
 - Identified cost avoidance from initiatives of \$264K in 2005.
 - Expected to be less costly to support than current system

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Individual Program Initiatives

- LPD-17 Initiatives
 - Replacement system for 4 classes of ships
 - Reduced manpower by 20 percent
 - Managed ownership cost-reduction approach
 - Identified tools, metrics, baseline allocated to integrated product teams
 - Goal: avoid costs through design.
 - Implemented 96 initiatives
 - Refrigeration plant, diesel generators
 - Reduced anticipated maintenance by 25 percent.
 - Results: Estimated reductions of \$80 million in 2005. Life cycle goal is 5.2 billion; \$4.3 billion estimated to date.

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Individual Program Initiatives

- Common Ship
 - Crosscutting program identifies hull, mechanical, electrical improvements to reduce operating and support costs, reduce workloads, improve quality of life aboard ship, and improve readiness.
 - Goal: reduce costs \$68 million by 2005.
 - Methodology: analyze what's costing the most and prioritize projects for return on investment.
 - Projects include improved watertight doors, anti-staining paint, corrosion resistant materials, and insertion of new technologies.
 - Result: \$91 million cost avoidance by fiscal year 2005.

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Observations

- The Navy and Marine Corps identified cost drivers and successfully pursued a number of cost-reduction efforts
 - Operating and support cost reductions are one of a number of objectives that the Navy and Marine Corps pursued. Other objectives include workload reduction, performance improvement, quality-of-life improvements. In making improvements to satisfy these objectives, operating and support costs are lowered as well.
 - Developmental systems such as AAV and LPD-17 are not pushing the envelope on technology, so some options for lower operating and support cost will become available.

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Observations

- The Navy and Marine Corps, like the other services, estimate operating and support costs but have difficulty with the reliability of data in tracking actual costs or using data to establish baselines that programs could be held accountable for as they are now accountable for growth in development and production cost.
- Additional accountability could raise the priority of operating and support costs and focus attention on them.

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