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Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services U.S. Senate

September 2000

DEFENSE ACQUISITIONS

Higher Priority Needed for Army Operating and Support Cost Reduction Efforts

GAO

Accountability * Integrity * Reliability

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DOD Department of Defense

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The Honorable James M. Inhofe
Chairman
The Honorable Charles S. Robb
Ranking Minority Member
Subcommittee on Readiness
and Management Support
Committee on Armed Services
United States Senate

The high cost of operating and supporting the Army's weapon systems is absorbing an increasing share of its budget and is reducing funds available for buying new systems. This, according to Department of Defense (DOD) officials, results in older weapons being kept in the inventory longer, further increasing their costs and thereby further reducing funds available for modernization. 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.

In April 1998, DOD established an initiative that expanded the purview of program managers involved in designing and producing new weapon systems to include more responsibility for the total life-cycle costs[1] of these systems. Under this initiative, each of the services was directed to designate 10 pilot programs to test innovative approaches to reduce operating and support costs. To monitor the effectiveness of this approach, Congress, in Section 816 (a) of the Strom Thurman National Defense Authorization Act for Fiscal Year 1999, directed DOD to designate and report to Congress on 10 of the 30 pilot programs. DOD has designated the 10 pilot programs for section 816 (a) purposes but has not yet assessed or reported on their effectiveness. In conjunction with these initiatives, and to free up funding for its modernization efforts, in January 1999, DOD set broad goals for each service to lower the operating and support costs of weapon systems. By fiscal year 2000, systems under development are expected to have projected life-cycle costs 20 to 50 percent lower than the actual costs of the systems they are replacing. Fielded systems are

[1] Life-cycle costs are the total costs of acquiring and owning a weapon or materiel system over its full life, including development, procurement, operation, support, and disposal.

expected to reduce their actual operating and support costs by 20 percent by fiscal year 2005.

Concerned about the degree to which DOD has focused on reducing weapon system operating and support costs, you asked us to evaluate DOD's efforts in this area. This is our second report responding to your request. Our first report discussed the Air Force's efforts to reduce operating and support costs of its weapon systems.[2] This report addresses the effectiveness of (1) the Army's efforts to reduce projected operating and support costs for weapon systems under development and (2) the Army's efforts to reduce operating and support costs of fielded weapon systems. We examined seven of the Army's pilot programs. Details on the programs we reviewed are discussed in appendix I.

Results in Brief

The Army is unlikely to be effective in significantly reducing the projected operating and support costs of its weapon systems under development because it has not established a sufficiently high priority for operating and support costs and has not put the needed mechanisms in place to achieve such reductions. Specifically, the Army (1) has not assigned accountability for operating and support cost reductions nor established a requirement that each weapon system achieve a specific level of cost reductions and (2) lacks complete and reliable data on the actual operating and support costs of the weapon systems that are being replaced. Without a requirement to achieve a specific level of operating and support cost reductions, program managers have little incentive or priority to trade off acquisition cost, schedule, and performance requirements during development to achieve long-term operating and support cost savings. For the two developmental systems in our review—the Comanche helicopter and the Crusader Self-Propelled Howitzer—efforts are underway to improve the systems' supportability, reliability, and maintainability. While these efforts should have an impact on the systems' operating and support costs, we were unable to link any actions or tradeoffs to specific reductions in operating and support costs. The program managers for the Comanche and the Crusader focused mostly on meeting acquisition cost, schedule, and performance requirements. Further, the Army does not have complete and reliable data on the operating and support costs for systems that are being replaced; as a result, program managers lack the data needed to

[2] *Defense Acquisitions: Higher Air Force Priority Needed to Achieve Operating and Support Cost Reductions* (GAO/NSIAD-00-165, Aug. 29, 2000).

accurately project operating and support costs and to determine whether they can achieve DOD's goal of reducing new systems' life-cycle costs by 20 to 50 percent over those of the systems they are replacing. In addition, because the Army has not historically budgeted or managed in this way, it has not collected and maintained data on all elements of each weapon system's operating and support costs. For example, the Army's cost information system does not include data on several cost elements—including the costs of supply maintenance or software support—for each weapon system because the Army does not budget for these cost elements at the individual weapon system level. Although the Army was unable to estimate their exact magnitude, the absence of these cost elements may have a material impact on a weapon system's overall operating and support cost.

Although the Army has identified some potential reductions, its operating and support cost reduction efforts for fielded systems lack the priority they need to be effective in meeting DOD's goals. As with developmental systems, the Army (1) has not assigned accountability for operating and support cost reductions nor established a requirement that each fielded system maintain these costs at or below a specific level and (2) lacks complete and reliable data on each system's operating and support costs. Without a requirement to limit operating and support costs by individual weapon system, there is little incentive or priority for program managers or other parties influencing funding decisions to make up-front investments to achieve long-term operating and support cost savings, particularly if such investments are in lieu of near-term readiness or performance improvements. As a result, operating and support cost reduction efforts prior to the establishment of the pilot programs were limited. The pilot programs have initiatives that may impact operating and support costs but that are funded primarily to improve system performance, reliability, or maintainability—their impact on operating and support costs is secondary. For example, the Army plans to replace the engine in the Abrams tank primarily because reliability problems are affecting the tank's operations. The improved engine is expected to save about $13 billion in operating and support costs over a 30-year period. However, the first of the Abrams tanks to be outfitted with a more reliable engine will not be fielded until 2004, and the amount of operating and support cost savings resulting by 2005—the target date for achieving DOD's cost reduction goals—will be limited. Further, some pilot program managers are pursuing initiatives, such as contracting out logistics support, as a way to achieve cost reductions without an up-front investment. However, the overall Army-wide savings from contracting out logistics support activities have not been clearly

demonstrated. For example, we have reported that the projected savings from contracting out the Apache helicopter's logistics support activities are questionable.[3] In addition to the absence of operating and support cost requirements, accountability for achieving the cost reduction has not been established. Currently, a number of officials, including the program manager, have some influence over decisions impacting operating and support costs. A new directorate has been established to bring an Army-wide focus to operating and support cost reduction efforts, but it has not been fully funded or staffed. Also, as with systems under development, the lack of complete and reliable operating and support cost data for fielded systems limits program managers' ability to assess cost trends and drivers as well as to identify cost reduction initiatives.

We are recommending that the Army take steps to improve the management of operating and support costs for systems under development and fielded systems. In commenting on this report, DOD agreed with the general thrust of this report and that significant steps remain to be taken to reduce operating and support costs and generally agreed with our recommended actions.

Background

According to DOD, operating and support costs of fielded weapon systems are increasing and are reducing the funds available for modernization. Reduced funding for new weapons is requiring the Army to keep fielded weapon systems in its inventory longer; this increases operating and support costs and further decreases funds available for modernization. The Under Secretary of Defense (Acquisition, Technology, and Logistics) has characterized this as a "death spiral."

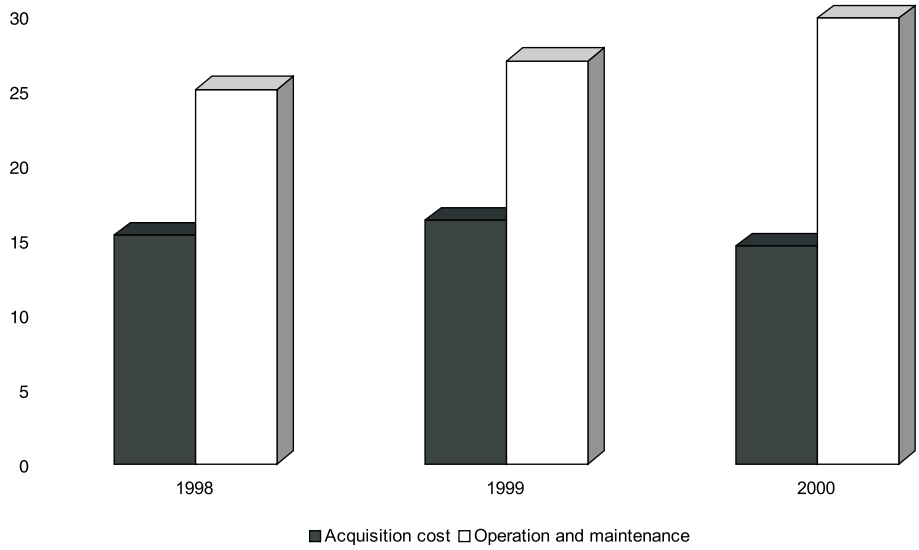
Currently, DOD budgets over $40 billion a year for acquisition and operation and maintenance of Army weapon systems. In fiscal years 1998-2000, the operation and maintenance[4] portion of the Army' s budget averaged about $27 billion a year. Included in this amount were funds for civilian pay, contract services for maintenance of equipment and facilities,

[3] Army Logistics: Status of Proposed Support Plan for Apache Helicopter (GAO/NSIAD-99-140, July 1, 1999).

[4] The operation and maintenance appropriation provides funds for most but not all operating and support costs. For example, military personnel costs are not funded by the operation and maintenance appropriation. The Army could not provide an accurate estimate of its annual operating and support costs for any of its weapon systems.

fuel, supplies, and repair parts for weapons and equipment. As shown in figure 1, acquisition funds (i.e., procurement and research and development funds) allocated to the Army over the 3-year period decreased about 5 percent, from $15.3 billion to $14.5 billion, while funding for operation and maintenance activities increased about 19 percent, from $25 billion to $29.8 billion. (All funding and cost data presented in this report are in then-year dollars.)

Figure 1: Trend in Army Funding for Acquisition and Operation and Maintenance, Fiscal Years 1998-2000 (then-year dollars in billions)



Source: Our analysis of DOD appropriation data.

Historically, Army weapon system program managers have been responsible for development and acquisition. Their primary goals are to develop and produce systems (1) with the performance required by users, (2) on schedule, and (3) at an acceptable cost. While some attention has been given to the cost of operating and supporting a weapon system after it is fielded, responsibility for these functions after systems are fielded generally shifts to other Army agencies such as maintenance depots, software support facilities, and operating bases. DOD has long identified this division of responsibility as a key cause of higher weapon system operating and support costs, which are generally estimated to account for about 60 to 70 percent of a system's total life-cycle costs.

In April 1998, DOD established an initiative that expanded the purview of program managers involved in designing and producing new weapon systems to include more responsibilities for the total life-cycle costs of these systems. This initiative directed each of the services to designate 10 weapon system programs as pilot programs to test innovative approaches to reduce operating and support costs. To monitor the effectiveness of this approach, Congress, in Section 816 (a) of the Strom Thurman National Defense Authorization Act for Fiscal Year 1999, directed DOD to designate and report to Congress on 10 of these pilot programs. Subsequently, in a 1999 report to Congress, DOD designated three Army pilot programs, three Navy pilot programs, and four Air Force pilot programs. However, DOD has not yet assessed or reported on the effectiveness of the pilot programs. Table 1 lists all of the Army pilot programs.[5]

Table 1: Army Pilot Programs

Systems in development	Fielded systems
Comanche helicopter	Abrams tank[a]
Crusader Self-Propelled Howitzer	Apache helicopter[a]
	Advanced Fielded Artillery Tactical Data System[a]
	Cargo helicopter
	Improved Target Acquisition System for the Tube Launched, Optically Wire Guided Missile
	Heavy Expanded Mobility Tactical Truck[b]
	Multiple Launch Rocket System, High Mobility Artillery Rocket System[b]

[a]Reported to Congress under the Fiscal Year 1999 Strom Thurmond National Defense Authorization Act.

[b]Not included in our review.

The pilot programs are expected to examine all aspects of their operating and support costs and to identify innovative ways to reduce these costs without impacting operational readiness. Some of the actions being considered are changes in operational and business practices, changing

[5] The Army originally designated 10 pilot programs. It subsequently reduced them to nine because of duplication.

maintenance processes, and improving the reliability and maintainability of specific system components.

In conjunction with these initiatives, and to free up funding for its modernization efforts, in January 1999 DOD set two broad goals for lowering the operating and support costs of both fielded and developmental weapon systems. First, by fiscal year 2000, developmental weapon systems are expected to have total projected life-cycle costs 20 to 50 percent lower than those of the systems they are replacing. For example, the Crusader Howitzer program, which will replace the Paladin Howitzer, is expected to have a projected life-cycle cost about $3 to $8 billion lower than that of the Paladin. Since operating and support costs make up about 60-70 percent of a weapon system's total life-cycle costs, the services would need to reduce operating and support costs by 20-50 percent in order to reduce overall life-cycle cost by 20-50 percent.

Second, the annual operating and support costs of fielded systems are to be reduced by 20 percent by fiscal year 2005. Interim goals were also established: a 7-percent reduction by fiscal year 2000 and a 10-percent reduction by fiscal year 2001. This means that, using the fiscal year 1997 operation and maintenance appropriation of about $20 billion as the base year, the Army is expected to reduce the annual operating and support costs of its fielded weapon systems by about $4 billion by fiscal year 2005.

Lacking Incentives and Data, Army Unlikely to Significantly Reduce Operating and Support Costs of New Systems

Because the Army has not established specific operating and support cost reduction requirements for each weapon system, and because complete and reliable cost data is not readily available, the Army is unlikely to significantly reduce the operating and support costs of its systems in development and meet DOD's cost reduction goals. Without a specific requirement, program managers are not accountable and have little incentive to trade off acquisition cost, schedule, and performance requirements during development to achieve long-term operating and support cost savings. Without complete and reliable data, the Army lacks a means to measure progress in meeting DOD's cost reduction goals.

Without Specific Requirement, Army Operating and Support Cost Reduction Initiatives Lack Priority

The Army does not give the same level of priority to managing long-term operating and support costs of developmental weapon systems as it gives to acquisition cost, schedule, and performance. Although operating and support cost estimates are required early in the acquisition process, and goals are sometimes established, the two developmental systems in our review—the Comanche and the Crusader—did not have a requirement to maintain their operating and support costs at or below a specific level. According to DOD acquisition officials, without a specific operating and support cost requirement during program development, program managers are not accountable for operating and support cost reductions and have little incentive or priority to trade off acquisition cost, schedule, and performance requirements for long-term operating and support cost savings. Without an operating and support cost requirement for each weapon system under development, the Army's efforts to achieve these cost reductions are less likely to receive the priority needed to meet DOD's cost reduction goals.

An established requirement has a much greater impact on program priorities and trade offs than a goal. DOD Regulation 5000.2-R calls for the establishment of key baseline cost, schedule, and performance requirements to be measured, tracked, and managed. Program success is measured by the achievement of these requirements. Moreover, an operating and support cost requirement would require the same level of management attention as the cost, schedule, and performance parameters. Similarly, deviations from an operating and support cost requirement would also require the same senior-level review as other key requirements.

In the mid-1990s, DOD established an acquisition reform initiative to help control weapon system cost during design and development. The Cost as an Independent Variable initiative entails setting aggressive yet realistic cost objectives when defining operational requirements, acquiring defense systems, and managing achievement of objectives. This strategy is required for all DOD developmental programs and establishes a structured way for all developmental programs to consider trade offs in cost, schedule, and performance. However, without a requirement to maintain operating and support costs at or below a specific level, these trade-offs are focused primarily on the program's near-term acquisition costs. DOD believes that the best time to reduce long-term operating and support costs is in the design phase of the acquisition process, but achieving such reductions often involves higher acquisition costs or trade offs in schedule or performance.

The program managers of the two pilot programs involving developmental systems—the Comanche helicopter and the Crusader Self-Propelled Howitzer—are using Integrated Product Teams[6] to address supportability, reliability, and maintainability issues, including development of strategies for acquisition and contracts, cost estimates, evaluation of alternatives, logistic management, and cost-performance trade offs. The Teams also monitor operating and support cost estimates and goals, organize and coordinate efforts to reduce the major "drivers" of support costs, and provide recommendations to the program manager. For example, the Comanche helicopter and the Crusader Self-Propelled Howitzer Integrated Product Teams identified the top operating and support cost drivers for their programs and are developing plans to reduce them. Crusader expects to reduce the number of personnel required to support and operate the weapon (support and crew personnel account for about 60 percent of its operating and support costs).[7] Comanche expects to improve the reliability and maintainability of specific components; this should have an impact on operating and support costs. However, without a specific operating and support cost requirement, program managers have little or no incentive to make such trade offs. Program managers for the Comanche and Crusader focused mostly on meeting acquisition cost, schedule, and performance requirements. In both of these pilot programs, we were unable to link any actions taken under Cost as an Independent Variable with specific operating and support cost reductions. The Crusader project office acknowledged that the only measurable effect of using Cost as an Independent Variable would be on development and production costs, not on operating and support costs.

A 1999 DOD study reported that about 80 percent of surveyed program management officials[8] believe that a complete estimate of a weapon system's operating and support costs should be baselined early in the program and updated regularly to ensure visibility and measurability at

[6] Integrated Product Teams include representatives from all appropriate disciplines working together.

[7] The Crusader is currently being redesigned to reduce its size and weight significantly.

[8] Program management officials include the program executive officer, who is the management official responsible for providing overall direction and guidance to program managers for development, acquisition, testing, systems integration, product improvement, and fielding of assigned programs and who reports directly to the Army Acquisition Executive.

decision-making milestones.[9] The study noted that regularly updated operating and support cost baselines would allow program managers to have visibility over these costs as the development and testing process proceeds, as well as before and after fielding. Although both the Crusader and Comanche programs have life-cycle cost estimates that are updated at major decision points—which are held every few years—neither program has regularly updated the operating and support cost portion of those estimates. As a result, the Comanche and Crusader program managers do not have good visibility over these costs nor the means to determine whether their operating and support cost reduction efforts are effective.

Incomplete Operating and Support Cost Data Hampers Cost Management

Complete and reliable operating and support cost data for each weapon system is not readily available to Army program managers because the Army does not collect and maintain data on all elements of a weapon system's operating and support cost. In previous work on operation and maintenance funds, we noted that DOD's financial management systems are not designed to capture the full costs of weapon systems.[10] Without complete and reliable operating and support cost data for the systems being replaced—such as the Kiowa Warrior helicopter and Paladin Howitzer—the Army does not have an adequate baseline against which to measure progress in meeting DOD's cost reduction goals for developmental systems such as the Comanche helicopter and Crusader Howitzer.

The Army's Operating and Support Management Information System provides historical cost data on Army weapon systems and is the primary source of operating and support data used by program managers to project costs of new systems, forecast spare parts budgets, and generally manage their programs. The Army uses this data system to develop its operating and support cost budget for weapon systems for consumable items such as repair parts, petroleum, oil, lubricant, fuel, and ammunition, as well as for intermediate maintenance. However, the system does not (1) meet the Army's need for total visibility of operating and support cost data, (2) provide a basis for an accounting of all funds used for operation and support, or (3) provide a complete and reliable basis for developing and reporting the costs of weapon system support. An official responsible for

[9] *Program Manager Oversight of Life-Cycle Support, DOD Program Manager Oversight of Life-Cycle Support Study Group*, Section 912 (c) (Oct. 1999).

[10] *Defense Budget: DOD Should Further Improve Visibility and Accountability of O&M Fund Movement* (GAO/NSIAD-00-18, Feb. 9, 2000).

operating and support cost data at the Army's Cost and Economic Analysis Center stated that the available operating and support cost data for each weapon system is incomplete and often 12-18 months out-of-date. Several operating and support cost elements that are used to establish the Army's operating and support budget estimates, such as contractor logistics support, supply maintenance, supply depot support, and software support, are not included in the database. The Army was unable to estimate the exact magnitude of these cost elements but their absence may have a material impact on a weapon system's overall operating and support cost.

Lack of Requirements and Complete Cost Data Is Likely to Limit Army's Operating and Support Cost Reductions for Fielded Systems

The Army has not assigned accountability for nor established a requirement for each fielded system to maintain its operating and support costs at or below a specific level. Without such a requirement, the funding priority for cost reduction initiatives is limited. According to Army program office officials, the Apache helicopter, the Abrams tank, and the Cargo helicopter are among the most costly Army systems to operate and support and offer many opportunities for operating and support cost savings. Until these systems were designated as pilot programs in 1999, initiatives specifically targeted to reduce operating and support cost were limited or were not often successful in competing for funding. Also, some ongoing initiatives were aimed primarily at achieving performance improvements, while operating and support cost impacts were of secondary importance. In some other cases, pilot program managers are pursuing operating and support cost reduction initiatives, such as contractor logistics support, that do not require up-front funding.

Further, because cost reduction initiatives for the pilot programs are relatively recent, they are not projected to have a significant savings impact for a number of years; therefore, the Army will not likely meet the DOD goal of a 20-percent cost reduction by 2005. For example, the first of the Abrams tanks to be outfitted with a more reliable engine will not be fielded until 2004, and the amount of savings achieved by 2005 will be limited. Likewise, plans to upgrade the engine and reduce vibration in the Cargo helicopter will result in only a limited number of refurbished aircraft being fielded by fiscal year 2004, and any reduction in operating and support costs by 2005 will be limited. Finally, the lack of complete and reliable cost data makes it difficult for Army program managers to assess and manage these costs. Better data is needed to assess operating and support cost trends and cost drivers and to identify cost reduction initiatives. Details of the fielded systems' cost reduction initiatives that we reviewed are in appendix I.

Earlier Efforts to Reduce Operating and Support Costs Were Limited

Without a requirement that each system maintain its operating and support costs at or below a specific level, there is little incentive for program managers to request up-front investments to achieve long-term operating and support cost savings, particularly if such investments are in lieu of near-term readiness or performance improvements. Throughout much of the late 1990s, the Army has had three efforts in place to identify and implement cost reduction projects, but due to other, higher funding priorities, these efforts have not resulted in significant operating and support cost reductions in fielded weapon systems. The three efforts are (1) supply management, Army operating and support cost reductions; (2) commercial operating and support savings initiative; and (3) reliability, maintainability, and sustainability operating and support cost reductions. Each of these efforts provides funding for cost reduction projects involving the redesign of individual spare parts and certain maintenance improvements. According to the program coordinator, these projects are limited in scope and, due to their limited funding, have not had a significant impact on operating and support costs. For example, projected funding for the Army's reliability, maintainability, and sustainability initiative totals only $14 million for fiscal years 2000-05. This level of funding will support only a small portion of the proposed cost reduction projects under the initiative. The latest list of proposed Army reliability, maintainability, and sustainability cost reduction projects for fiscal year 2002 alone contains 25 projects estimated to cost a total of about $50 million. Overall, the program coordinator estimates that about $200 million a year would be needed to fully fund all potential projects under this initiative.

Operating and Support Cost Reductions Are a Secondary Priority

Operation and support cost reduction efforts require up-front investments for long-term returns, and the Army has been reluctant to make a commitment to these investments. However, it has been willing to invest in performance enhancement initiatives with indirect operating and support cost savings. As a result, projected reductions in operating and support costs for some pilot programs are not the product of a separate initiative, but the by-product of efforts to upgrade the system's performance capabilities. For example, the Army plans to replace the engine in the Abrams tank primarily because reliability problems are affecting the tank's operations. Secondarily, the Army projects that the engine replacement, which will cost over $2 billion, will save $13 billion in operating and support costs over 30 years. Similarly, planned vibration reduction and engine upgrades to the Cargo helicopter are primarily to improve operating performance, readiness, and safety. Although the cost of the upgrades has

not yet been determined, they are projected to reduce operating and support costs by an estimated $2.6 billion over 20 years.

Some Program Managers Pursuing Contractor Support Initiatives to Reduce Operating and Support Cost

In the absence of a requirement for each system to maintain its operating and support costs at or below a specific level and a lack of direct control or influence over operating and support functions or funds, pilot program managers have sought alternative ways of reducing system costs. For example, some managers of pilot programs—such as the Apache helicopter—are pursuing contractor logistic support initiatives, in which a contractor is responsible for many system support functions. Through these initiatives, program managers expect to achieve significant operating and support cost savings, as well as more direct control over support activities and funding. However, the overall Army-wide cost savings from these initiatives that contract out logistics support have not been clearly demonstrated. For example, we reported that the level of savings projected from contracting out the Apache helicopter's logistics support activities is questionable. Moreover, program managers can only influence, but cannot decide, whether to rely on contractor support or on the Army's depot maintenance support capability.

No Clear Accountability for Operating and Support Cost Reductions

In addition, operating and support costs and functions for each weapon system are managed by a variety of Army organizations, many of them outside the program manager's office. Different organizations control daily operations (such as training, tactical deployments, and day-to-day maintenance) of the weapons, depot maintenance, transportation, supply, and other activities. Program managers have little control or influence over these organizations; as a result, they have limited control over major operating and support costs drivers. For example, local commanders decide the spending priority for all operation and maintenance funds received at the command level. Program managers needing weapon system support funds must compete annually with other weapon systems and other support activities at the local command level and have no guarantee that support funding will be available to them when they need it. To bring increased Army-wide focus—beyond the program manager—to operating and support cost reduction efforts, the Army established a Total Ownership Cost Directorate in 1999 to (1) consolidate the management of the Army's operating and support cost reduction initiatives and (2) provide leadership, guidance, and implementation of weapon system cost reduction initiatives. The centralized Directorate is expected to elevate weapon system cost reduction initiatives to senior management level and to optimize the

allocation of operating and support cost reduction funding Army-wide. However, an official from the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) office acknowledged that funding for the Directorate would most likely not be available until at least fiscal year 2002. The Directorate is operating with temporary personnel borrowed from other Army elements and with a reserve officer.

Data Limitations Impact Operating and Support Cost Management for Fielded Systems

The lack of complete data on each fielded system's operating and support costs makes it difficult for Army managers to assess and manage these costs. The Cargo helicopter program best illustrates the need for additional operating and support cost data. The program manager awarded a contract to have a new operating and support cost baseline developed by October 2000 to gain more insight into the causes of the aircraft's high operating and support costs and to collect data on maintenance events at the individual aircraft level. The program manager did so because the Army's operating and support cost data system can provide data on a weapon system's total spare part consumption but cannot provide more specific data on which weapon system used which parts and the costs to install each of the parts. According to the program manager, it is impossible to assume management responsibility for operating and support cost reduction initiatives if the weapon system's total operating and support costs or the reasons for those costs are unknown.

Cost data on individual maintenance events, such as removal and assessment of part failures, are not available from the Army's operating and support cost database. For example, the cost of removing and assessing a suspected faulty component and replacing the same component is not available from the database. Although the Army's Operating and Support Management Information System was not designed to provide this sort of data, we believe it is this kind of operating and support cost data that is needed by Army program managers to assess cost trends and cost drivers and to identify cost reduction initiatives.

Conclusions

The Army is not likely to significantly reduce the operating and support costs of its weapon systems and, therefore, will not likely meet DOD's cost reduction goals. Hence, the "death spiral" of increasing operating and support costs and decreasing funds for modernization will likely continue.

The primary reason the Army is not likely to be successful is because it has not granted a sufficiently high priority to operating and support cost

reductions nor put a mechanism in place to achieve cost reductions. Specifically, without a requirement to achieve a specific level of operating and support cost savings, program managers have little incentive or priority to trade off acquisition costs, schedule, and performance requirements during development to achieve long-term operating and support cost savings. An operating and support cost requirement would have a much greater impact on program priorities and would require the same level of management attention as the cost, schedule, and performance parameters. Similarly, deviations from an operating and support cost requirement would also require the same senior-level review as other key requirements. In addition, program managers do not have complete and reliable data needed to identify and track operating and support costs. Without complete and accurate cost data, program managers are unable to assess cost trends and cost drivers and to identify cost reduction opportunities.

Further, there is no clear accountability for operating and support cost reductions. A number of officials, including the program manager, have some influence over decisions impacting operating and support costs. The Army established the Total Ownership Cost Directorate to, among other things, bring increased Army-wide focus to operating and support reduction efforts. However, initial funding for the directorate was not expected to be available until fiscal year 2002.

Recommendations

To increase the priority of and to provide the mechanisms needed to achieve significant reductions in operating and support costs, we recommend that the Secretary of Defense direct the Secretary of the Army to

- establish operating and support cost requirements for developmental and fielded systems and regularly monitor each system's progress in meeting the requirement,
- develop a more complete and accurate accounting of each weapon system's operating and support costs by expanding the Army's current cost data system to include additional cost elements such as software and supply system support costs, and
- promptly provide the necessary funding and staffing to fully establish the Total Ownership Cost Directorate.

Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD agreed that significant steps remain to be taken to reduce operating and support costs and generally agreed with our recommended actions. DOD also stated that it shares some of our concerns about the pace, risk, and costs associated with reducing operating costs and acknowledged the difficulty of devising a strategy that allows meaningful cost reductions while focusing on its highest priorities—improving safety, readiness, and combat capability. DOD noted that pilot programs are investigating various cost reduction approaches, but that it was too soon to determine which approaches would yield the best results.

DOD generally agreed with our recommendation for establishing operating and support cost requirements for developmental and fielded systems. For developmental systems, DOD asserted that a newly established process has already improved the Army's evaluation of operating and support costs by establishing those costs as co-equals with schedule and performance requirements. We found, however, that the Army's new policy makes supportability, rather than operating and support costs, a co-equal with cost, schedule, and performance. As a result, it does not specifically increase the priority needed to reduce these costs. For fielded systems, DOD believes that its efforts to track all operating and support costs elements are still evolving and that it is premature to establish a cost reduction requirement. While we agree that efforts to track all operating and support cost elements is still evolving, we believe that the Army's Operating and Support Management Information System can be modified to provide useful and timely data to track and manage the operating and support costs of fielded systems. As a result, we believe that our recommendation for an operating and support cost requirement for both fielded and developmental systems is still valid.

DOD generally agreed with our second recommendation that the Secretary of the Army develop a more complete and accurate accounting of each weapon system's operating and support costs. DOD stated that, as lessons and data are gleaned from the pilot programs (which are intended to examine all aspects of operating and support costs and identify innovative ways to reduce those costs), an alternative operating and support cost data system may be adopted. DOD also stated that it has several actions and activities that are under way to accomplish the objective of more complete and accurate accounting of operating and support costs but then went on only to mention an information system already in use. We continue to believe that improvements can and should be promptly made to the current

information system in order to improve operating and support cost information and visibility.

DOD generally agreed with our third recommendation that the Secretary of the Army promptly provide the necessary funding and staffing to fully establish the Total Ownership Cost Directorate. DOD stated that the Army already has ongoing efforts to support the Total Ownership Cost initiatives. In discussion with an Army official from the Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), we learned that the Army has increased its staffing of the Total Ownership Cost Directorate from three to seven permanent personnel and has slated additional staffing increases for fiscal years 2001 and 2002. We are encouraged by the Army's decision to provide additional staffing for the Directorate. However, the appropriate staffing level needed by the Directorate to fulfill its objective of bringing increased Army-wide focus to operating and support cost reduction efforts is not yet known and will depend, in large part, on the overall priority given to those efforts.

DOD's comments are reprinted in appendix II. DOD also provided some technical comments, which we incorporated in the report where appropriate.

Scope and Methodology

Although the Army originally designated 10 programs as pilots, it subsequently reduced them to 9 because of duplication. We reviewed seven of the pilot programs' implementation plans and their operating and support cost reduction initiatives. Because of similarities in the pilot programs and time constraints, we only selected seven of the programs for inclusion in our review: Apache helicopter; Abrams tank; Cargo helicopter; Improved Target Acquisition System for the Tube Launched, Optically Wire Guided Missile; Advanced Field Artillery Tactical Data System; Comanche helicopter; and Crusader Self-Propelled Howitzer.

To assess the effectiveness of the Army's efforts to reduce projected operating and support costs for weapon systems under development, we reviewed and evaluated the Comanche helicopter's and the Crusader Self-Propelled Howitzer's cost reduction implementation plans and other pertinent program office documentation. Additionally, we interviewed key personnel in the program office and discussed the plans with cognizant DOD and Army officials.

To assess the effectiveness of the Army's efforts to reduce operating and support costs of fielded weapon systems, we reviewed and evaluated operating and support cost reduction implementation plans for the Abrams tank, the Apache helicopter, the Advanced Field Artillery Tactical Data System, the Cargo helicopter, and the Improved Target Acquisition System for the Tube Launched, Optical Wire Guided Missile. We also reviewed and evaluated operating and support cost data in the Army's Operating and Support Management Information System for fielded systems.

We also reviewed other pertinent documents and interviewed key personnel at DOD, Army, Army Cost and Economic Analysis Center, and weapon system program offices.

We obtained documents and interviewed officials from the offices of the Secretary of Defense and the Army, Washington, D.C.; the U.S. Army Aviation and Missile Command, Huntsville, Alabama; the National Guard Aviation Support Facility, Birmingham, Alabama; the 101st Airborne Division, Fort Campbell, Kentucky; and the Army Materiel Command, Alexandria, Virginia. Additionally, we held video teleconferences with the Program Executive Officer for Ground Combat Support Systems, Picatinny Arsenal, New Jersey; the U.S. Army Tank and Automotive Command, Warren, Michigan; and the U.S. Army Communication and Electronics Command, Fort Monmouth, New Jersey.

We conducted our review from July 1999 through July 2000 in accordance with generally accepted government auditing standards.

We are sending copies of this report to other interested congressional committees; the Honorable William Cohen, Secretary of Defense; the Honorable Louis Caldera, Secretary of the Army; and the Honorable Jacob Lew, Director, Office of Management and Budget. Copies will also be made available to others on request.

If you have any questions regarding this report, please contact me on (202) 512-4841. GAO contacts and major contributors to this report are listed in appendix III.

James F. Wiggins
Director, Acquisition and Sourcing Management

Details of Operating and Support Cost Reduction Initiatives for Fielded System Pilot Programs

Apache Helicopter

The Apache helicopter is the most costly Army system in terms of annual operating and support costs. To aid in reducing these costs, the Apache program manager has created an Integrated Product Team as the primary tool for identifying cost reduction opportunities. The team's focus has been on addressing the Apache's top operating and support cost drivers. According to the program manager, the team has been successful in identifying and implementing many operating and support cost saving initiatives, at a cost of $4.74 million.

The program office estimates that the ongoing initiatives will achieve over $434 million in total projected operating and support cost savings over 10 years. For example, cost reduction efforts associated with the Apache's tail and main rotor alone have potential cost reductions of about $44 million. Under the pilot program, the Apache program manager plans to manage operating and support cost reduction efforts through the Prime Vendor Support concept, which uses a single contractor to provide all weapon system support (support is currently being managed by several Army organizations). The program office estimates that this concept will result in about $380 million in operating and support cost savings over 5 years. However, DOD has questioned the projected savings under this concept, and the implementation plan is controversial because, among other things, it would require the Army to give the entire Apache spare parts inventory, estimated to be worth about $1 billion, to the contractor without compensation. A decision on the Prime Vendor Support concept was pending at the time we completed our review.

Abrams Tank

According to the program office, the Abrams tank is the second most costly Army system in terms of annual operating and support costs and accounts for half the repair parts costs by the Army's entire ground combat fleet. According to the Abrams program manager, the tank engine is a major contributor to the system's high operating and support costs. The Abrams program has recently received about $1 billion in investment funds to begin an initiative that will focus on replacing the current engine with an improved one. While this initiative is designed to improve the tank engine's performance, it will indirectly reduce operating and support costs. The engine initiative is estimated to cost a total of about $2 billion and yield a projected $13 billion in operating and support cost savings over 30 years.

Cargo Helicopter

The Cargo helicopter is the fourth most costly Army system in terms of annual operating and support costs. The program manager has initiated two initiatives designed to improve the performance and reduce the operating and support costs of the helicopter by an estimated $2.6 billion over 20 years. The first initiative is a vibration reduction effort, which will involve the remanufacturing of the aircraft's airframe. The effort is based on analyses of vibration studies conducted by the Army, the Navy, the Air Force, and civilian institutions. According to the program manager, eliminating excessive vibration, which causes the airframe to crack and other components to break, will increase the aircraft's reliability by minimizing hardware failures, thereby enhancing its performance and readiness. According to the program manager, the effort will cost an estimated total of about $120 million and will yield long-term operating and support cost savings of about $1 billion.

The second initiative involves converting the helicopter's engine to be more fuel-efficient. This will involve the replacement of all magnesium components with aluminum or stainless steel, which will significantly reduce engine corrosion and are expected to reduce significantly operating and support costs. The upgrade is estimated to cost about $1.2 billion. Operating and support cost savings have not yet been determined.

In this pilot program, the program manager's approach to operating and support cost reduction is different from others in our review. While other pilot programs consider only system hardware or personnel cost drivers as the sole basis when planning operating and support cost reductions, the Cargo helicopter program manager also plans to consider non-hardware issues such as the frequency of scheduled maintenance or training. The aircraft's maintenance manual will be reviewed to determine whether it still requires certain repairs, and computer-based maintenance training that can be transported Army-wide has been developed to limit costly downtime.

Improved Target Acquisition System for the Tube Launched, Optically Wire Guided Missile

The Improved Target Acquisition System for the Tube Launched, Optically Wire Guided Missile was originally designed with reduced operating and support costs in mind. According to a program office official, operating and support costs were reduced because the number of reparable components was reduced by over 60 percent, built-in testing was improved, and the need for additional test equipment was eliminated. Further, the program manager plans to use only contractor logistical support for the system. The official stated that by implementing a contractor logistical support concept,

rather than using depot support, the Army expects to reduce operating and support costs by $300 million over the life of the program.

Advanced Field Artillery Tactical Data System

The Advanced Field Artillery Tactical Data System is a heavily software-oriented program. One operating and support cost reduction initiative the project office plans will reduce the size of its computer from 300 to 100 pounds. The new computer is expected to cost less to operate and support. The program manager has not yet calculated the reduced operating and support costs of the new computer.

Comments From the Department of Defense

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY

18 SEP 2000

Mr. James Wiggins
Associate Director, Defense Acquisitions Issues
National Security and International Affairs Division,
U.S. General Accounting Office
Washington, D.C. 20548

This is the Department of Defense (DoD) response to the GAO draft report, "DEFENSE ACQUISITIONS: Higher Priority Needed for Army Operating and Support Cost Reduction Efforts, dated August 11, 2000 (GAO Code 707445/OSD Case 2064). The Department partially concurs with the draft report and agrees that significant steps remain to be taken to reduce Operating and Support (O&S) costs.

Reducing O&S costs is a high-priority objective in the Office of the Secretary of Defense, the Military Services, and the Defense agencies. Unprecedented attention is being given to reducing these costs, not only because, as your report recognizes, it is a large and growing share of the total DoD budget, but also because supportability is a critical component of operational effectiveness. While combat capability, safety, and readiness have been and remain our highest priorities, we must also place a high priority on reducing O&S costs.

We share some of your concerns about the pace, risk, and costs of business practices rengineering and O&S cost reduction. Our challenge is in devising a strategy that allows for meaningful O&S cost reductions while focusing on our highest priorities. As your report recognizes, there are dramatic initiatives proposed by the DoD Components to test new concepts. Technological changes and new business practices position DoD operations to provide much better service to the warfighter while reducing O&S costs. We must also operate within the guidelines of the 50/50 depot maintenance workload rules and maintain core competency in addition to other legislative and regulatory requirements. Meeting all of these requirements demands a balanced and carefully crafted approach.

While the pilot programs are investigating diverse and innovative approaches to meet these requirements, it is too soon now to determine which approach(es) will prove to yield the best results. As we evaluate the results of the pilot programs, we will adopt the successes and apply them to other programs to gain the widest possible benefits of the innovations. We hope and expect that these efforts will allow us to achieve significant O&S cost reductions.

DoD comments on the draft GAO report recommendations are provided in the enclosure. The Department appreciates the opportunity to comment on the draft report.

Sincerely,

George R. Schneiter
Director
Strategic and Tactical Systems

Enclosure

GAO DRAFT REPORT DATED AUGUST 11, 2000
(GAO CODE 707445) OSD CASE 2064

"DEFENSE ACQUISTIONS: HIGHER PRIORITY
NEEDED FOR ARMY OPERATING AND SUPPORT
COST REDUCTION EFFORTS"

DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATION

Now on p. 17.

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to establish operating and support cost requirements for developmental and fielded systems and regularly monitor each system's progress in meeting the requirement. (p. 20/Draft Report)

DOD RESPONSE: Partially concur. However, for fielded systems, efforts to track all O&S cost elements are still evolving, and it is premature to establish such a requirement. For fielded systems that are DoD pilot programs, all the military departments report O&S cost as well as progress made towards cost avoidance, in accordance with the individual program goals. For development programs, the process by which the Army evaluates O&S costs has been improved by establishing O&S costs as a co-equal with schedule and performance based on the Army Acquisition Executive memorandum dated February 27, 2000. Further, DoD documents that set cost goals or that report on costs, which in some cases include total ownership cost, as well as other program parameters are: the operational requirements document (for "newer" programs), selected acquisition reports and pilot program baselines. See recommendation 2 below.

Now on p. 17.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to develop a more complete and accurate accounting of each weapon system's operating and support costs by expanding the Army's current cost data system to include additional cost elements such as software and supply system support costs. (p. 20/Draft Report)

DOD RESPONSE: Partially concur. As the lessons and data are gleaned from the pilot program Total Ownership Cost initiatives, an alternative to the current accounting approach may be adopted. Additionally, DoD already has several actions and activities underway to accomplish these objectives. This includes Visibility and Management of Operating and Support Cost (VAMOSC), which is a DoD-wide historical data collection system for fielded major defense programs. The Department uses VAMOSC data to identify O&S costs so that they may be managed and controlled.

Now on p. 17.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to promptly provide the necessary funding and staffing to fully establish the Total Ownership Cost Directorate. (p.21/Draft Report)

DOD RESPONSE: Partially concur. Army efforts are already ongoing to support the Total Ownership Cost initiatives.

GAO Contacts and Acknowledgments

GAO Contacts

James F. Wiggins (202) 512-4841
William Graveline (256) 650-1414

Acknowledgments

In addition to those named above, Leon S. Gill, William Petrick, and Wendy Smythe made key contributions to this report.

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