

**GAO**

Report to the Subcommittee on  
Readiness, Committee on Armed  
Services, House of Representatives

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February 2012

# DEFENSE LOGISTICS

## Improvements Needed to Enhance Oversight of Estimated Long- term Costs for Operating and Supporting Major Weapon Systems



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Highlights of [GAO-12-340](#), a report to the Subcommittee on Readiness, Committee on Armed Services, House of Representatives

## Why GAO Did This Study

With the nation facing fiscal challenges and the potential for tighter defense budgets, Congress and the Department of Defense (DOD) have placed more attention on controlling the billions of dollars spent annually on weapon system operating and support (O&S) costs. These costs include, costs for repair parts, maintenance, and personnel, and account for about 70 percent of the total costs of a weapon system over its life cycle. The selected acquisition report (SAR) is DOD's key recurring status report on the cost, schedule, and performance of major defense acquisition programs and is intended to provide authoritative information for congressional oversight of these programs. Oversight of O&S costs is important because many of the key decisions affecting these life-cycle costs are made during the acquisition process. GAO reviewed weapon system O&S cost estimates that DOD submits in the SAR. Specifically, GAO determined the extent to which the SARs provide consistent and reliable O&S cost estimate information that enables effective oversight of these weapon system costs. To conduct its review, GAO analyzed SAR data for 84 major systems that submitted O&S cost estimates in the 2010 SAR and selected a nonprobability sample of 15 systems for more in-depth review.

## What GAO Recommends

To enhance visibility of weapon system O&S costs during acquisition, GAO recommends that DOD improve its guidance to program offices on cost reporting and also improve its process for reviewing these costs prior to final submission of the SAR to Congress. DOD concurred with GAO's recommendations.

View [GAO-12-340](#). For more information, contact Cary B. Russell at (404) 679-1808 or [russellc@gao.gov](mailto:russellc@gao.gov).

February 2012

## DEFENSE LOGISTICS

### Improvements Needed to Enhance Oversight of Estimated Long-term Costs for Operating and Supporting Major Weapon Systems

#### What GAO Found

DOD's reports to Congress on estimated weapon system O&S costs are often inconsistent and sometimes unreliable, limiting visibility needed for effective oversight of these costs. The SAR statute requires that life-cycle cost reporting for major weapon systems be uniform, to the extent practicable, across the department, but GAO found a number of inconsistent practices in how program offices were reporting life-cycle O&S cost estimates in the SAR. Program offices were inconsistent in (1) the explanatory information they included with the cost estimates; (2) the source of the cost estimate they cited as the basis for the reported costs; (3) the unit of measure they used to portray average costs; (4) the frequency with which they updated reported costs; and (5) the reporting of costs for an antecedent system being replaced by the new weapon system. For example, 35 (42 percent) of the 84 programs that reported O&S costs in the 2010 SAR did not cite a source of these data, contrary to DOD's guidance, and 57 (68 percent) of the programs did not report O&S costs for an antecedent system. Also, O&S cost submissions in the SAR did not always incorporate best practices for presenting cost estimates, such as tracking cost changes over time and identifying cost drivers. In addition, 11 systems did not provide O&S cost estimates in the 2010 SAR.

Although SARs are intended to provide Congress with authoritative program information on major weapon systems, 7 of the 15 sample programs GAO reviewed submitted unreliable O&S cost estimate data in the 2007, 2009, or 2010 SARs. For example, an Air Force program underreported O&S costs by \$2.1 billion (fiscal year 2002 dollars), or 18 percent. While some of the program offices did not provide an explanation for the errors in the submitted data, others cited specific reasons. For example, one Navy program office underreported O&S costs in the SAR and explained that it excluded certain costs that were not under its control, such as externally funded spare parts and military personnel. However, excluding such costs is contrary to the SAR statute. An Air Force program reported current and projected funding for the program rather than estimated life-cycle O&S costs. This practice also had the effect of underreporting these costs.

DOD's reports to Congress on estimated weapon system O&S costs were often inconsistent and sometimes unreliable due to a lack of (1) detailed implementation guidance for reporting these costs and (2) an effective process for reviewing the O&S cost sections of the SAR before final submission to Congress. DOD's guidance collectively provides minimal instructions for O&S cost reporting. The guidance also does not incorporate some of the best practices GAO has identified for presenting cost estimates. Further, although the SAR data submitted by program offices are subject to multiple reviews within the military services and by the Office of the Secretary of Defense, this review process has not provided assurance that O&S costs are reported consistently and reliably. In the absence of improvements to the SAR guidance and to the review process, deficiencies in reporting O&S costs are likely to continue. Improved reporting of O&S costs in the SAR could help to place more emphasis on assessing, managing, and controlling long-term weapon system O&S costs.

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# Contents

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Letter		1
	Background	5
	DOD's Reports to Congress on Estimated Weapon System O&S Costs Were Inconsistent and Sometimes Unreliable	9
	Conclusions	28
	Recommendations for Executive Action	28
	Agency Comments and Our Evaluation	30
Appendix I	Scope and Methodology	33
Appendix II	DOD's Guidance for Implementing the Statutory SAR Requirements	36
Appendix III	Comments from the Department of Defense	39
Appendix IV	GAO Contact and Staff Acknowledgments	43
Tables		
	Table 1: Source of Cost Estimate Cited for 84 Programs Reporting O&S Costs in the 2010 SAR	12
	Table 2: Major Weapon System Programs That Did Not Identify O&S Costs in Their 2010 SARs	21
	Table 3: Major Weapon Systems in GAO's Nonprobability Sample	35

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## Abbreviations

CAPE	Cost Assessment and Program Evaluation
DOD	Department of Defense
FBCB2	Force XXI Battle Command Brigade and Below
GPS	Global Positioning System
JTRS	Joint Tactical Radio System
MRAP	Mine Resistant Ambush Protected
O&S	operating and support
OSD	Office of the Secretary of Defense
SAR	Selected Acquisition Report

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**United States Government Accountability Office**  
Washington, DC 20548

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February 2, 2012

The Honorable J. Randy Forbes  
Chairman  
The Honorable Madeleine Bordallo  
Ranking Member  
Subcommittee on Readiness  
Committee on Armed Services  
House of Representatives

With the nation facing fiscal challenges and the potential for tighter defense budgets, both Congress and the Department of Defense (DOD) in recent years have placed more attention on controlling the billions of dollars spent annually on weapon system operating and support (O&S) costs. These costs include, among other things, costs for repair parts, maintenance, and personnel, and historically have accounted for about 70 percent of a weapon system's total costs.<sup>1</sup> In short, the acquisition of a weapon system today involves a significant financial commitment to that system over its entire life cycle, a period that may last several decades from the system's development to the time it is removed from DOD's inventory. For example, the program office for the F-35 Joint Strike Fighter, the newest aircraft being acquired for the Air Force, Navy, and Marines, estimated in 2010 that life-cycle O&S costs were about \$1.0 trillion, in addition to an estimated \$379.4 billion in total acquisition costs.<sup>2</sup>

Since 1969, the selected acquisition report (SAR) has been the key recurring summary status report to Congress on the cost, schedule, and

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<sup>1</sup> According to DOD officials, O&S costs generally range from 60 to 80 percent of a weapon system's total costs, depending on the weapon system type. DOD previously estimated that weapon system product support costs in fiscal year 2008 were at least \$132 billion. According to DOD, product support encompasses materiel management, distribution, technical data management, maintenance, training, cataloging, configuration management, engineering support, repair parts management, failure reporting and analysis, and reliability growth. Under this definition, product support does not include all the costs categorized as O&S costs.

<sup>2</sup> These costs are expressed in then-year dollars. Estimated O&S costs in fiscal year 2002 dollars were about \$420.3 billion.

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performance of DOD's major defense acquisition programs.<sup>3</sup> (We also use the term major weapon systems to refer to these programs, although some programs involve other types of defense systems.) The SAR is intended to provide authoritative information needed for congressional oversight of these programs. Although much of the data reported within the SAR is acquisition related, in 1985 Congress amended the SAR statute to require that a full life-cycle cost analysis also be included in the SAR,<sup>4</sup> and subsequently specified that this life-cycle cost analysis include estimated O&S costs.<sup>5</sup> This information is important for effective oversight because many of the key decisions affecting a weapon system's O&S costs over its life cycle are made while the system is still in the acquisition process. Acquisition-related decisions about the design, materials, and technology for the system affect the logistics support that is eventually needed to keep the system available and ready after it enters into DOD's inventory. Further, investments to improve reliability, availability, and maintainability during acquisition can reduce the future O&S costs of DOD's weapon systems. For example, higher reliability can be designed into the weapon system during its development by reducing technical requirements, using highly reliable and proven components, or investing more in early testing, thus improving prospects for readiness and reducing O&S costs across the life cycle. As the visibility and management of O&S costs have become more of a focus in the department, the Office of the Secretary of Defense (OSD) has recognized the SAR as a source of O&S cost information for oversight of weapon system acquisitions. Therefore, the O&S costs reported in the SARs are

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<sup>3</sup> Major defense acquisition programs are those estimated by the Under Secretary of Defense for Acquisition, Technology and Logistics to require an eventual total expenditure, including all planned increments, of more than \$365 million for research, development, test, and evaluation, based on fiscal year 2000 constant dollars (approximately \$509 million in fiscal year 2010 dollars), \$2.190 billion for procurement, based on fiscal year 2000 constant dollars (approximately \$3.054 billion in fiscal year 2010 dollars), or are designated as a major defense acquisition program by the Milestone Decision Authority. 10 U.S.C. § 2430; Under Secretary of Defense for Acquisition, Technology and Logistics Directive-Type Memorandum (DTM) 09-027-Implementation of the Weapon Systems Acquisition Reform Act of 2009, attachment 1, para. 13 (Dec. 4, 2009).

<sup>4</sup> Department of Defense Authorization Act, 1986, Pub. L. No. 99-145, § 1201 (1985).

<sup>5</sup> See National Defense Authorization Act for Fiscal Year 1991, Pub. L. No. 101-510, § 1407(b) (1990); Federal Acquisition Streamlining Act of 1994, Pub. L. No. 103-355, § 3002(c) (1994).

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not only reported to Congress, but they are also included in internal OSD management reports as well.

In response to the Weapon Systems Acquisition Reform Act of 2009,<sup>6</sup> we previously reviewed the growth in O&S costs of major weapon systems and reported that DOD lacked key information needed to effectively manage and reduce O&S costs—including life-cycle O&S cost estimates and complete historical data on actual O&S costs.<sup>7</sup> DOD generally concurred with the recommendations in that report and stated that it was taking corrective actions. More recently, the National Defense Authorization Act for Fiscal Year 2012 directs DOD to take a number of actions consistent with our recommendations, with the aim of better assessing, managing, and controlling weapon system O&S costs.<sup>8</sup> In light of the findings from our prior work, you requested that we review the O&S cost estimate information for major weapon systems that DOD submits to Congress within the annual SARs. Specifically, our objective was to determine the extent to which the SARs provide consistent and reliable O&S cost estimate information to enable effective oversight of these weapon system costs.

To meet our objective, we reviewed statutory requirements and DOD guidance for reporting weapon system O&S cost estimates in the SARs. We also reviewed DOD cost-estimating guidance, which identifies the specific categories of O&S costs for weapon systems, and GAO-identified cost-estimating best practices to identify the scope and nature of cost estimate information needed for effective program management and oversight. We interviewed DOD and military service officials responsible for weapon system acquisition, logistics, and cost analysis to understand DOD's approach and process for reporting O&S cost estimates in the SARs.

We obtained SARs from the Defense Acquisition Management Information Retrieval system, which is a web-based system used within DOD to collect and maintain SAR information submitted by the program

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<sup>6</sup> Pub. L. No. 111-23 (2009).

<sup>7</sup> GAO, *Defense Management: DOD Needs Better Information and Guidance to More Effectively Manage and Reduce Operating and Support Costs of Major Weapon Systems*, [GAO-10-717](#) (Washington, D.C.: July 20, 2010).

<sup>8</sup> Pub. L. No. 112-81, § 832 (2011).

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offices. We determined that the data in this system accurately reflected information submitted by weapon system program offices and therefore were sufficiently reliable for the purposes of our analysis. We obtained and analyzed annual SAR data for all 84 major weapon systems that reported O&S costs in their annual SAR for 2010. This analysis covered the time period from 2005 through 2010 with the exception of 2008.<sup>9</sup> In addition, from these 84 weapon systems, we selected a sample of 15 programs for further analysis.<sup>10</sup> Through a data collection instrument, interviews, and other contacts, we obtained information from the program offices on the O&S cost reports they had submitted in the SAR, including cost estimates, where available, that formed the basis for their cost reports. We designed the sample to ensure that a range of weapon systems were represented based on commodity type<sup>11</sup> and the military service under which the system acquisition was being managed. The results from this nonprobability sample cannot be used to make inferences about all major weapon systems because the sample may not reflect all characteristics of the population. We also obtained SARs for 11 weapon systems that reported an annual SAR for 2010 but did not identify O&S costs in the SAR. We obtained information from the program offices about the reasons these costs were not reported. Our scope and methodology is discussed further in appendix I.

We conducted this performance audit from February 2011 to February 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>9</sup> DOD did not report annual SARs for 2008. In addition, because some of the weapon systems began reporting SARs at some point during this time period, our analysis for such systems only dates back to their initial SAR report.

<sup>10</sup> Our original sample included 16 weapon systems. However, one system, the Army's Increment 1 Early-Infantry Brigade Combat Team, was subsequently canceled.

<sup>11</sup> We categorized systems as aircraft, ship, ground, or "other" (e.g., missile programs and command and control systems).

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## Background

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### Statutory Requirements for Submitting SARs to Congress

Requirements for submitting SARs to Congress, including the timing of these reports and the types of information to be included, are established in statute. Under 10 U.S.C. § 2432, the Secretary of Defense shall submit to Congress at the end of each fiscal-year quarter a report on current major defense acquisition programs.<sup>12</sup> Each SAR for the first quarter of a fiscal year (also known as the comprehensive annual SAR) shall be designed to provide to the Committee on Armed Services of the Senate and the Committee on Armed Services of the House of Representatives the information these committees need to perform their oversight functions. The comprehensive annual SAR shall be submitted within 60 days after the date on which the President's Budget is sent to Congress for the following fiscal year.

The statute also requires that the annual SAR include a full life-cycle cost analysis for each major defense acquisition program and each designated major subprogram included in the report that is in the system development and demonstration stage or has completed that stage.<sup>13</sup> Further, the Secretary of Defense must ensure that this requirement is implemented in a uniform manner, to the extent practicable, throughout DOD. The term full life-cycle cost, with respect to a major weapon system, means all costs of development, procurement, military construction, and operations and support, without regard to funding source or management control. If the major weapon system has an antecedent system, a full life-cycle cost analysis for that system must also be reported. The SAR reporting requirement ceases after 90 percent of the items are delivered or 90 percent of planned expenditures under the program are made.

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<sup>12</sup> SARs for the second, third, and fourth quarters of a fiscal year, known as quarterly SARs, are not required for a program if a report on the program was included in a previous SAR for that fiscal year and during the period since that report the program has not experienced cost increases or schedule delays beyond certain thresholds.

<sup>13</sup> This stage of acquisition is now called engineering and manufacturing development.

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## DOD's Guidance for Implementing the Statutory SAR Requirements

DOD has issued various guidance documents that implement the statutory SAR requirements. This guidance is contained in an acquisition instruction,<sup>14</sup> a guidebook on defense acquisition best practices,<sup>15</sup> a draft SAR policy,<sup>16</sup> and an annual memorandum on preparing SARs.<sup>17</sup> DOD also has developed instructions<sup>18</sup> and training for entering SAR data into the Defense Acquisition Management Information Retrieval system.<sup>19</sup> According to officials, program offices rely on DOD's implementation guidance because the services do not have their own formal SAR reporting guidance. DOD's guidance is summarized below and discussed more fully in appendix II.

DOD's implementation guidance states that SARs should be submitted at program initiation or at the time that the program is designated as a major defense acquisition program, and then at least annually thereafter. The guidance requires the submission of a quarterly SAR after a program is rebaselined based on a major milestone decision.<sup>20</sup> With respect to reporting O&S costs in the SAR, DOD's implementation guidance states

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<sup>14</sup> DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Dec. 8, 2008).

<sup>15</sup> DOD, *Defense Acquisition Guidebook* (2011).

<sup>16</sup> OSD, *Selected Acquisition Report* (draft) (2006). Although issued in draft, the policy was never issued in final form.

<sup>17</sup> At the time we conducted our review, the most recent annual guidance was issued in January 2011. Under Secretary of Defense for Acquisition, Technology and Logistics, Memorandum for Assistant Secretaries of the Military Services, *December 2010 Selected Acquisition Reports (SARs) Guidance* (Jan. 14, 2011).

<sup>18</sup> Under Secretary of Defense for Acquisition, Technology and Logistics, *SAR Data Entry Instructions (draft)* (Nov. 5, 2010).

<sup>19</sup> Throughout the report, we collectively refer to all of DOD's SAR guidance as DOD's implementation guidance, including the draft SAR policy.

<sup>20</sup> DOD's acquisition process includes a series of decision milestones as the systems enter different stages of development and production. As part of the process, the DOD component or joint program office responsible for the acquisition program is required to prepare life-cycle cost estimates, which include O&S costs, to support these decision milestones and other reviews. Key decision milestones include milestone B, which approves entry into the engineering and manufacturing development phase, and milestone C, which approves entry into the production and deployment phase, including low-rate initial production. Continuation into full-rate production occurs after the full-rate production decision review is held. In conjunction with a milestone decision, a program may be rebaselined, which means that the cost, quantity, schedule, and performance goals are changed to reflect the current status.

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that program offices should provide explanatory information such as the source and date of the cost estimate, assumptions underlying the estimate, the antecedent system used for comparison purposes, and an explanation of how average annual costs were calculated. DOD officials stated that programs should report the cost estimate that was developed for the latest acquisition milestone decision.<sup>21</sup> According to the guidance, programs should report total estimated O&S costs and should also report average O&S costs by a unit of measure (e.g., average annual cost per squadron, average annual cost per system).<sup>22</sup> DOD's guidance states that if a program has an antecedent system,<sup>23</sup> then O&S costs and assumptions should be submitted for the antecedent system.

In addition to its SAR implementation guidance, DOD has issued guidance for developing weapon system O&S cost estimates, which provide the basis for the O&S cost section of each SAR. Specifically, the OSD Cost Analysis Improvement Group, now known as the Cost Assessment and Program Evaluation (CAPE) office, has established guidance for preparing and presenting life-cycle O&S cost estimates at acquisition milestone reviews.<sup>24</sup> O&S cost elements, for example, are to be grouped into six major areas—unit-level personnel, unit operations, maintenance, sustaining support, continuing system improvements, and indirect support—which are further broken down into 23 subelements. In addition, we have identified federal government best practices for preparing and presenting cost estimates. These practices include tracking cost estimates over time; identifying the major cost drivers; identifying the

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<sup>21</sup> Training materials from the Defense Acquisition University similarly reflect that the estimate developed for the latest acquisition milestone should be reported in the SAR. However, the draft SAR policy differs in that it calls for reporting the “most recent” estimate of life-cycle O&S costs.

<sup>22</sup> The guidance directs program offices to report total estimated O&S costs in constant dollars as well as then-year dollars, and to report average costs in constant dollars. Constant dollars measure the value of purchased goods and services at price levels which are the same as the base year and, unlike then-year dollars, do not contain any adjustments for inflationary changes that have occurred or are forecasted to occur outside the base year.

<sup>23</sup> An “antecedent system” is defined by DOD as one that has been replaced by another due to obsolescence (technical or otherwise).

<sup>24</sup> OSD, *Operating and Support Cost Estimating Guide* (October 2007).

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method and process for estimating each cost element; and comparing the program-developed cost estimate to an independent cost estimate.<sup>25</sup>

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## DOD's Process and Schedule for Preparing SARs

When required, a comprehensive annual SAR is prepared for each major weapon system by the program office that is managing its acquisition. Program offices are responsible for weapon systems throughout the life cycle, to include implementing, managing, and/or overseeing their development, production, fielding, sustainment, and disposal. The reporting time frame for the annual SAR is linked to the issuance of the President's Budget, which occurs early in the calendar year, and the cost, schedule, and performance data reported in the annual SAR should reflect this budget request.<sup>26</sup>

The Office of the Under Secretary of Defense for Acquisition, Technology and Logistics begins the process by sending out its annual memorandum guidance in mid-January. Program offices then enter data into the Defense Acquisition Management Information Retrieval system and submit the SARs to OSD acquisition officials, generally after some level of internal review by the program office, the Program Executive Officer,<sup>27</sup> and the military service under which the program is organized. OSD officials review the SAR submissions, and officials within the Office of the Assistant Secretary of Defense (Logistics and Materiel Readiness) focus on the O&S section of the reports. OSD officials then hold a series of meetings with the services and program office representatives to discuss the SAR submissions and any recommended changes. Consistent with the statutory requirement, the final annual SAR is typically submitted to Congress in April, 60 days after the President's Budget has been submitted in February.

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<sup>25</sup> GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

<sup>26</sup> The annual SAR is dated at the end of the calendar year that just ended because it is the first quarterly SAR of the fiscal year. For example, the annual SAR prepared and reported in early calendar year 2011 is dated December 2010.

<sup>27</sup> A Program Executive Officer is the military or civilian official who has responsibility for directing the acquisition of several major weapon systems, as well as other acquisition programs. This individual reports to and receives guidance and direction from the service acquisition executive.

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## DOD's Reports to Congress on Estimated Weapon System O&S Costs Were Inconsistent and Sometimes Unreliable

Program offices reporting life-cycle O&S cost estimates in the SAR were often inconsistent in their cost reporting and also did not follow best practices for presenting cost estimates. In addition, some programs did not provide any O&S cost estimates in the 2010 SAR. Further, several of the programs we reviewed in more depth reported unreliable O&S cost data. The main cause for these deficiencies was a lack of detailed SAR implementation guidance for reporting O&S costs. In addition, DOD's process for reviewing the O&S cost sections of the SAR prior to their final submission did not provide assurance that the program offices reported costs uniformly, to the extent practicable, and that these reported costs were reliable. In the absence of improvements to the SAR guidance and to DOD's review process, deficiencies in reporting estimated life-cycle O&S costs are likely to continue. Such deficiencies may limit visibility needed for effective oversight of long-term weapon system O&S costs during the acquisition process.

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## Program Offices Were Inconsistent in Reporting Estimated Life-Cycle O&S Costs and Did Not Incorporate Best Practices for Presenting These Cost Estimates

The SAR statute requires that life-cycle cost reporting for major weapon systems be uniform, to the extent practicable, across the department, but we found a number of inconsistent practices in how program offices were reporting life-cycle O&S cost estimates in the SAR. Based on the SAR submissions we reviewed, program offices were inconsistent in (1) the explanatory information they included with the cost estimates, (2) the source of the cost estimate they cited as the basis for the reported costs, (3) the unit of measure they used to portray average costs, (4) the frequency with which they updated reported costs, and (5) the reporting of antecedent system costs. In addition to these inconsistencies, we found that SAR submissions also did not incorporate best practices for presenting cost estimates, such as tracking cost changes over time and identifying cost drivers. In addition, 11 systems did not provide O&S cost estimates in the 2010 SAR.

Submitting more consistent cost reports and incorporating best practices for presenting cost estimates would improve visibility of estimated life-cycle O&S costs in the SAR, as decision makers will have more information with which to evaluate the reported data. For example, the inclusion of the date and the source of the reported estimate provides context about the currency of the reported costs and the level of review (that is, whether the cost estimate was prepared by the program office, by the military service, or by CAPE). Likewise, the inclusion of significant assumptions underlying the cost estimate, an explanation of changes in the cost estimate from the prior year, and information on major cost drivers provides insight into the cost challenges facing the program. In

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Explanatory Information Was Often Minimal

addition, showing average costs using a common unit of measure allows for easier comparison of program costs to the costs of similar commodities (such as other aircraft programs).

DOD's implementation guidance for the SAR directs programs to include explanatory information in the narrative accompanying the O&S cost estimates, such as the source and date of the cost estimate, assumptions underlying the estimate (such as operating tempo, expected reliability and maintainability of the system, maintenance concept, and manning and logistics policies), the antecedent program used for comparison purposes, and an explanation of how average costs were calculated. Although explanatory information can provide context and background for understanding reported costs, we found that the explanatory information included in the O&S narrative was often minimal.

Of the 84 programs that reported O&S costs in the 2010 SAR, we found that 35 (42 percent) did not include the source of the estimate and 12 (14 percent) did not include the date of the estimate in the O&S narrative. Additionally, for the 15 programs in our sample, we found that beyond providing a few basic details such as the number of units that were to be acquired, their expected service life, and operating tempo, where applicable, the O&S narrative contained minimal explanation of reported cost estimates and the assumptions underlying these estimates, as the following examples illustrate:

- The program office for the Army's High Mobility Artillery Rocket System included several assumptions, such as the number of launchers and the service life. However, instead of reporting additional O&S cost estimate assumptions (such as operating tempo and expected reliability/maintainability) in the SAR narrative, the program stated that this information was available in the service cost estimate.
- The Joint Mine Resistant Ambush Protected (MRAP) vehicle program office noted a few specific assumptions, such as the expected service life of the fleet and the cost per mile for replenishing spare parts. However, the remaining O&S narrative for the program generically explained that the estimate included personnel, training, facilities, vehicle and component repair, and sustainment overhauls, but provided no other specifics on these areas.
- Only three programs—the Army's High Mobility Artillery Rocket System, the Air Force Joint Primary Aircraft Training System, and the

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Army's Force XXI Battle Command Brigade and Below (FBCB2)—included the maintenance concept planned for that system in their O&S narratives. However, even in these cases, the explanatory information for O&S costs was very limited.

- None of the 15 programs included assumptions on the reliability and maintainability of the weapon system in their O&S narrative.

While not required by DOD's implementation guidance, 1 of the 15 programs in our sample included explanatory information on cost drivers in the SAR O&S narrative. The V-22's SAR submission for 2009 provided an explanation of the significant O&S cost increase from the prior SAR in 2007. In the 2007 SAR, the total O&S costs reported were \$48.8 billion (fiscal year 2005 dollars). In the 2009 SAR, the program reported that this amount had grown to \$75 billion (fiscal year 2005 dollars), and that the O&S cost category showing the greatest increase was unit-level consumption.<sup>28</sup> In the O&S narrative, the program office attributed the majority of the cost increase to changes in the methodology used to estimate unit-level consumption costs. Specifically, the estimate was updated with the actual costs of parts from fiscal year 2009 and with projected future cost growth for parts higher than OSD's inflation indices.<sup>29</sup> The program office also noted actions being taken to reduce unit-level consumption costs, such as changes to contracting strategy and accelerated timelines for repair capabilities.

GAO-identified best practices for presenting cost estimates include identifying the largest cost elements and cost drivers, and providing enough information for informed decision making. In addition, we have previously reported that leading companies identify major drivers of O&S costs and work with manufacturers to reduce these costs.<sup>30</sup> During our

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<sup>28</sup> Unit-level consumption is an O&S cost category that includes a number of subelements such as the cost of fuel and energy resources; operations, maintenance, and support materials consumed at the unit level; depot-level reparable spares (individual parts, subassemblies, or assemblies) required for recurring repair; operational munitions expended in training; transportation in support of deployed unit training; temporary additional duty/temporary duty pay; and other unit-level consumption costs, such as purchased services (e.g., equipment leases and service contracts).

<sup>29</sup> OSD's inflation indices are published annually and are used to develop cost estimates.

<sup>30</sup> GAO, *Best Practices: Setting Requirements Differently Could Reduce Weapon Systems' Total Ownership Costs*, [GAO-03-57](#) (Washington, D.C.: Feb. 11, 2003).

Sources of Reported Cost Estimates Varied among Programs

current review, we found that programs typically use CAPE’s O&S cost element structure in reporting O&S costs, but their presentation is limited to the six major elements (e.g., unit-level personnel, maintenance, indirect support). Since each major O&S cost element includes various costs, this information is not sufficient to identify specific cost drivers. Using lower-level cost elements, as provided for in CAPE’s cost element structure, could provide greater visibility of O&S costs for oversight by decision makers. For example, as noted in the case of the V-22 discussed above, the unit-level consumption cost element consists of a number of subelements that can provide additional insight into the discrete factors driving a change in the estimated life-cycle O&S costs for that system.

Various cost estimates may be developed over the life cycle of a weapon system, and DOD officials stated that programs should report the cost estimate developed for the latest acquisition milestone decision. We found that program offices—when a source was cited—cited several different sources as the basis for their reported O&S cost information in the 2010 SAR, and they did not provide an explanation for selecting the source that was used rather than another source that may have been available. As shown in table 1, for the 84 programs that included O&S costs in the 2010 SAR, 42 (50 percent) of the programs cited a specific cost estimate as the source of reported O&S costs. These sources were either a program office cost estimate, service cost estimate, or CAPE independent cost estimate. Another 35 programs (42 percent) did not cite a source, as previously noted. The remaining 7 programs (8 percent) cited a source other than a specific cost estimate.

**Table 1: Source of Cost Estimate Cited for 84 Programs Reporting O&S Costs in the 2010 SAR**

Source cited in SAR	Number of programs
No source cited	35
Program office cost estimate	23
Service cost estimate	15
Other	7
CAPE independent cost estimate	4
<b>Total</b>	<b>84</b>

Source: GAO analysis of 2010 SAR data.

Five programs in the “other” category in table 1 referred to cost estimates but did not provide enough detail to determine what type of cost estimate was used. For example, one program cited a “validated cost estimate”

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without additional specificity about this estimate. Similarly, four programs stated only that the source of their SAR O&S costs was a cost estimate prepared for an acquisition decision, but they did not provide additional information to identify a specific cost estimate. The remaining two programs in the “other” category in table 1, both of which were included in our sample, cited a source other than a cost estimate. One of these programs, the Navy Multiband Terminal, reported total costs from the milestone C acquisition program baseline,<sup>31</sup> despite the existence of a service cost estimate prepared for the acquisition decision in July 2010. The other program, the Air Force’s Navstar Global Positioning System (GPS), reported using current and future funding data instead of a cost estimate.

Overall, six programs in our sample were among those that did not cite the source of the estimate used to report O&S costs. When we asked these six programs what source was used, five stated that the O&S cost estimate data in the 2010 SAR were derived from program office cost estimates, and the remaining program office stated that the source was a CAPE independent cost estimate. The other nine programs in our sample had cited a source, with five citing a program office cost estimate; two citing a service cost estimate; and two, as noted above, citing either an acquisition program baseline or funding data as the source of their O&S costs.

As shown in table 1, some programs cited a CAPE independent cost estimate as the source of the O&S costs reported in the 2010 SAR. However, we found that one program in our sample, the LHA 6 America Class, cited a program office cost estimate even though CAPE had developed an independent cost estimate. Further, while not required, the program did not mention in the SAR that an independent cost estimate had been developed. Since 2005 the LHA 6 America Class program has reported total O&S costs of \$4.45 billion (fiscal year 2006 dollars) in its SAR submissions, reflecting a 2005 program office cost estimate. However, CAPE’s 2006 independent cost estimate of the program’s O&S costs was about \$300 million (7 percent) higher. According to a CAPE memorandum, this higher estimate was also not adjusted for cost growth above inflation. CAPE noted that O&S costs for the LHA 1, an antecedent

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<sup>31</sup> An acquisition program baseline quantifies key parameters for the performance, cost, and schedule of a program throughout the acquisition phase.

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system, had increased 4 percent annually since 1990 due to increased mission personnel and overhaul costs. According to CAPE, adjusting for this same rate of cost growth above inflation in its LHA 6 estimate would result in an additional \$530 million throughout the system's life cycle, or total O&S costs of \$5.29 billion. Additionally, F-35 officials told us that they plan to continue using the program office's cost estimate to report O&S costs in the SAR although CAPE is preparing an independent cost estimate for the program's next acquisition milestone.

GAO-identified best practices for presenting cost estimates include providing a comparison of the program estimate to an independent cost estimate, with an explanation of results and differences. Such a comparison is beneficial because an independent cost estimate should provide an objective and unbiased assessment of expected program costs that tests the program's estimate for reasonableness. History has shown a pattern of higher, more accurate cost estimates the further away from the program office the independent cost estimate is prepared. In the 2009 Weapon Systems Acquisition Reform Act, Congress placed greater emphasis on independent review of program cost estimates<sup>32</sup> by requiring that CAPE review cost estimates prepared in connection with all major weapon systems, and conduct independent cost estimates for certain systems prior to the milestone A, milestone B, low-rate initial production, and full-rate production acquisition decisions. Prior to the Act, CAPE was required to conduct independent cost estimates for some programs, but was not required to review cost estimates prepared for all major weapon systems.

Units of Measure for Reporting  
Average Costs Were Not  
Consistent

DOD's implementation guidance for the SAR states that programs should report average O&S costs in a unit of measure determined by the military service under which the system's acquisition is being managed. Programs are to report these average costs using CAPE's major cost elements. We found that several program offices had changed the unit of measure they reported in the SAR from that used in previous SARs. In addition, we found that the units of measure that were being reported varied, particularly among aircraft programs. These inconsistencies make it difficult to compare a program's current and prior-year costs, or to compare costs of similar programs.

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<sup>32</sup> According to our Cost Estimating and Assessment Guide, an independent cost estimate is the most rigorous form of independent review; however, other independent reviews are also useful for decision making.

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Of the 84 programs that reported O&S costs in the 2010 SAR, 5 (6 percent) changed the average unit of measure reported from that used the prior year. Specifically, two aircraft programs went from reporting costs per squadron in the 2009 SAR to reporting costs per aircraft in their 2010 SAR, a missile program went from reporting costs per unit in the 2009 SAR to reporting total program costs in the 2010 SAR, and two programs for communications systems went from reporting total program costs in the 2009 SAR to reporting costs per radio in the 2010 SAR. These last two programs— Joint Tactical Radio System (JTRS) Ground Mobile Radios and JTRS Handheld, Manpack, and Small Form Fit—were included in our sample. When we asked why they changed the unit of measure, program officials responded that the decision was made based on feedback they received from OSD when their 2010 SAR submissions were undergoing review. Of the 5 programs, only the two aircraft programs disclosed in the SAR that the unit of measure for that system had changed from the prior year. These two programs reported that they changed the unit of measure in order to standardize the calculation and increase the comparability of programs within the same major command.

Also, based on analysis of the 84 systems, we found the most variation in the unit of measure among aircraft systems. Different programs reported the average cost per flying hour<sup>33</sup> or the average annual cost per aircraft, per squadron of aircraft, or per the entire fleet. This issue was also evident among the programs in our sample that we analyzed in more depth. For example, the F-35 program reported average cost per flying hour, the V-22 program reported average cost per aircraft, the F-22 program reported average cost per squadron, and the Joint Primary Aircraft Training System (a training aircraft) reported average cost for the whole fleet. Ship costs, in contrast, were generally reported as average cost per ship or hull, although one ship program reported average annual cost per fleet. O&S costs for ground and other types of weapon systems were usually reported as either cost per weapon system unit or total cost for all weapon system units. However, a few other metrics were reported by these programs, such as average annual cost per battalion or per brigade combat team.

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<sup>33</sup> With regard to cost per flying hour, DOD officials explained that there are numerous formulas used throughout DOD. Thus, while several aircraft system program offices reported average cost per flying hour, they may not have used comparable data and calculation methodologies.

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Although portraying average costs with a unit of measure could be useful for tracking cost changes over time, we found that it was generally not possible to identify changes in estimated O&S costs based on the information reported in a single, annual SAR, since programs do not report costs from the prior SAR. Although major weapon system programs are required to identify and reconcile changes to estimated acquisition costs from the prior SAR, and to provide an explanation for each change, this is not required for O&S costs. Even though two of our sample programs, the V-22 and the Navstar GPS, included a statement in the SAR narrative that their O&S costs had changed, it was not possible to tell how much without the prior year's cost data. Our year-to-year comparisons of reported costs in the SARs showed that cost changes were occurring. For example, we found that the total estimated O&S costs for the JTRS Handheld, Manpack, and Small Form Fit program decreased from \$25.5 billion (fiscal year 2004 dollars) in 2009 to \$10.2 billion in 2010 (fiscal year 2004 dollars). This \$15.3 billion decrease occurred despite an increase in acquisition quantity of about 5,000 radios, from around 216,000 to around 221,000. This change, as well as the reasons for the change, was not identified in the SAR narrative. Similarly, we found that the total estimated O&S costs for the F-35 program increased \$50 billion (fiscal year 2002 dollars) from 2009 to 2010. The reason for this increase was not explained in the O&S narrative in the SAR.

According to GAO-identified best practices for presenting cost estimates, cost estimates should be tracked over time. Specifically, after an estimate is updated, a comparison of the current and prior estimate should be routinely performed and documented, and the results reported to decision makers. A documented comparison allows cost estimators to see how well they are estimating and how the program is changing over time. It also allows others to track the estimates and to identify when, by how much, and why the program cost more or less than planned.

#### Cost Estimates Were Updated at Different Intervals

Updated cost estimates can help to ensure that decision makers have the most current data available on a program. The SAR statute requires major defense acquisition programs to begin reporting when the program is approved to begin the development phase of the acquisition process at milestone B, and DOD's implementation guidance similarly states that a SAR should first be submitted when a program is initiated, normally at milestone B, or designated as a major defense acquisition program, and

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also when the program is rebaselined after a major milestone decision. DOD officials stated that programs should report the cost estimate developed for the latest acquisition milestone decision.<sup>34</sup> Our analysis for the 84 major weapon system programs that included O&S costs in the 2010 SAR showed that program offices were inconsistent in the frequency of their O&S cost updates between 2005 and 2010.<sup>35</sup> In many cases, programs provided more frequent updates than required by DOD's guidance, sometimes annually. However, 8 (13 percent) of the 61 programs that were included in the SAR every year during the 2005 to 2010 period did not update their O&S costs at any time during that period. In contrast, 47 programs (56 percent) of the 84 programs in the 2010 SAR reported using a cost estimate that was prepared in 2010 or 2011 as the source of their O&S costs.<sup>36</sup> These included 7 programs that began reporting SARs in 2009 or 2010.

Of the 15 programs in our sample, 3 did not update their SAR O&S costs during the period between 2005 and 2010, 5 updated their costs once, 5 updated their costs 2 or 3 times, and 2 updated their O&S costs 4 times during the period.<sup>37</sup> For example, the Navy's LHA 6 America Class program office has consistently reported the O&S costs estimated for milestone B, the program's only acquisition milestone while under SAR reporting requirements, in the annual SARs since 2005. Program officials told us that they were in the process of developing a new cost estimate for the LHA 7, the next ship in the America Class, and planned to use the new estimate as the source to report O&S costs in the program's 2011 SAR submission, if complete. Also, the Army's FCB2 program has not

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<sup>34</sup> Training materials from the Defense Acquisition University similarly reflect that the estimate developed for the latest acquisition milestone should be reported in the SAR. However, as noted earlier, the draft SAR policy differs in that it calls for reporting the "most recent" estimate of program O&S costs.

<sup>35</sup> As noted earlier, a number of programs did not include the date of the cost estimate used in the December 2010 SAR.

<sup>36</sup> Because the annual SAR reporting process occurs in the calendar year after the date of the SAR, a cost estimate that was completed in early 2011 could be used to report costs in the 2010 SAR.

<sup>37</sup> One of the programs that did not update O&S costs between 2005 and 2010 only started reporting annual SARs in 2009 and did not update the costs in 2010. Also, one of the programs that updated annually—the Navstar GPS—reported the program's current funding and projected requirements for an 8-year period instead of a life-cycle O&S cost estimate.

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updated its O&S SAR costs and is reporting costs estimated in 2004, even though the program's production quantity has quadrupled since then.<sup>38</sup> FBCB2 program officials told us that since its full-rate production decision in 2004, the program has experienced nearly continuous changes to its production quantity requirement, resulting in a significant effort to maintain and update the acquisition portion of the cost estimates and little time to research and update the O&S portion of the cost estimates.

In contrast, several of our sample programs updated their O&S costs annually. The F-35 program has updated the reported SAR O&S costs annually since 2006, the beginning of the period we reviewed. According to F-35 program officials, they chose to do this because the F-35 is a high-visibility, high-interest program. Further, estimating O&S costs annually helps inform DOD leadership and keeps partner countries updated, program officials noted. Additionally, the Joint MRAP program office has updated its SAR O&S costs annually since the program began reporting these costs in 2009 and plans to do so until the services assume responsibility for the system around 2013. Program officials said they are incorporating actual cost data from the field as it becomes available and updating O&S costs annually in order to give the services the best data once the transfer takes place. Finally, the Army's MQ-1C program has updated its SAR O&S costs annually since 2009. Although these costs were updated in 2010 for several reasons, including an increase in the number of systems to be acquired, program officials said they do not plan to update the program's O&S costs annually.

Officials for the remaining programs in our sample, which updated their O&S costs intermittently, gave various reasons for updating their program's SAR O&S costs when they did. While one program updated the SAR as required to reflect the O&S costs estimated for an acquisition decision, other programs in our sample chose to update the costs after they developed estimates to reflect changes to the acquisition program (e.g., changes in production quantity or schedule), to incorporate actual O&S costs that are considerably different than previously estimated, or to comply with guidance not related to the SAR. For example, the Navy's

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<sup>38</sup> The O&S costs reported in the FBCB2's 2006 SAR are different than those reported in the 2005 SAR. However, program officials told us that this was a mistake and the costs had not actually been updated. This case is discussed further later in our report.

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V-22 program office updated the O&S costs in the 2009 SAR because actual O&S costs incurred after the program's initial operational capability in 2007 for the Marine Corps and 2009 for the Air Force were significantly higher than had been anticipated in the program's most recent cost estimate. Prior to the 2009 update, the V-22 was reporting costs based on the estimate completed for an acquisition decision in 2005. The V-22 program office, in conjunction with U.S. Naval Air Systems Command, plans to review the program's O&S costs annually and update the SAR as necessary until the program stops reporting SARs. According to officials, the final deliveries of the V-22 are scheduled for 2020. As another example, the Joint Primary Aircraft Training System program updated O&S costs in the 2010 SAR after reporting the same costs since 2001. According to officials, an updated program office cost estimate was developed to comply with a policy from the program's major command that cost estimates be updated annually.

DOD acquisition best practices and GAO-identified cost-estimating best practices call for maintaining updated estimates of program costs. According to the Defense Acquisition Guidebook, although a DOD or service cost estimate is required at milestone reviews, it is a good practice for this estimate, or at least its underlying program office cost estimate, to be updated more frequently, usually annually. Updated estimates should be useful in program management and financial management throughout the life of the program. GAO-identified best practices call for continual updates of cost estimates to keep them relevant and current, as most programs do not remain static, especially those in development. Routine updates that incorporate actual data result in higher-quality estimates as the program matures. Further, updating the cost estimate provides an accuracy check, defense of the estimate over time, shorter estimate preparation times, and archived cost and technical data for use in future estimates.

#### Antecedent Program Costs Were Often Not Reported

In accordance with the SAR statute, DOD's implementation guidance states that if a program has an antecedent system, then O&S costs and assumptions should be submitted for the antecedent system. We found that program offices, however, were inconsistent in reporting on antecedent system costs, with many not reporting any O&S cost data. Specifically, 57 (68 percent) of the 84 programs reporting O&S costs in the 2010 SAR did not report O&S costs for an antecedent system. It was unclear from the SARs how program offices had identified an antecedent system or whether, in cases where no antecedent system costs were included, the program offices had determined that an antecedent system did not exist.

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Nine of the 15 programs in our sample did not report O&S costs for an antecedent system in the 2010 SAR. Officials from these program offices provided various reasons for not reporting antecedent system costs, including that the system was the first of its type or not intended to replace any other system, that the system had advanced capabilities or no other system was similar enough for comparison, and that the system was replacing several legacy systems. As an example, Joint MRAP program officials said other systems, such as the High Mobility Multipurpose Wheeled Vehicle, were too different for cost comparisons. As another example, the Navy Multiband Terminal program began reporting in the 2006 SAR and has never reported antecedent O&S costs. According to program officials, an antecedent system was not identified because the system was replacing several legacy weapon systems. However, during a joint OSD/Navy SAR review meeting in March 2011, the program office was instructed to list two systems as antecedent systems in the 2010 SAR. While the program identified the Super High Frequency and Navy Extremely High Frequency Satellite programs as antecedent systems in the O&S section of its SAR, it also stated that program costs for these systems were not readily available.

#### Some Programs Did Not Report Any O&S Costs

The SAR statute requires that all program costs be reported, regardless of funding source or management control. However, we found that of the 95 major weapon systems that had passed milestone B and reported costs in the 2010 SAR,<sup>39</sup> 11 (12 percent) did not identify any O&S costs in their SARs. The 11 programs, as of December 2010, accounted for a total estimated investment of \$56.7 billion (fiscal year 2011 dollars) for research and development, procurement, military construction, and acquisition-related operation and maintenance (see table 2). Most of the programs that did not report O&S costs were modifications to other weapon systems but qualify as major defense acquisition programs based on their procurement or research and development costs.

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<sup>39</sup> One program submitted a 2010 SAR but had not yet passed acquisition milestone B.

**Table 2: Major Weapon System Programs That Did Not Identify O&S Costs in Their 2010 SARs**

Dollars in billions

Major weapon system	Service	Estimated investment costs <sup>a</sup>
C-5 Avionics Modernization Program	Air Force	\$1.3
C-5 Reliability Enhancement and Reengineering Program	Air Force	\$7.3
GPS III	Air Force	\$4.3
Multi-Platform Radar Technology Insertion Program	Air Force	\$1.4
Airborne Signals Intelligence Payload	Air Force	\$0.5
Large Aircraft Infrared Countermeasures	Air Force	\$0.5
B-2 Radar Modernization Program	Air Force	\$1.3
B-2 Extremely High Frequency Satellite Communications	Air Force	\$0.6
Apache Block IIIB	Army	\$2.2
Chemical Demilitarization-Assembled Chemical Weapons Alternatives	DOD	\$10.0
Chemical Demilitarization-U.S. Army Chemical Materials Agency	Army	\$27.4

Source: GAO analysis of 2010 SAR data.

<sup>a</sup>Costs are in fiscal year 2011 dollars and include costs associated with research and development, procurement, military construction, and acquisition-related operation and maintenance.

Eight of the programs that did not report O&S costs are major modifications to, or subsystems of, Air Force weapon systems.<sup>40</sup> When we asked why O&S costs were not reported, officials from six Air Force programs said they did not report O&S costs in the 2010 SAR because they do not fund or track these costs. For example, officials for two programs associated with the C-5 aircraft explained that all O&S fleet costs are the responsibility of another entity, the System Program Manager at Warner Robins Air Logistics Center in Georgia. Program officials for the other two Air Force programs, the B-2 Radar Modernization Program and B-2 Extremely High Frequency Satellite Communications program, told us that these modification programs were expected to reduce O&S costs and they could not input cost reductions into DOD's Defense Acquisition Management Information Retrieval system, the database that maintains SAR data. In contrast to these modification programs, the Air Force's C-130 Avionics Modernization Program did report total estimated O&S costs in the 2010 SAR.

<sup>40</sup> These modifications are considered major defense acquisition programs in development and are therefore required to report submit SARs.

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According to officials, one of the remaining three programs—the Army’s Apache Block IIIB—was not required to report O&S costs in the SAR, as approved by the Defense Acquisition Executive.<sup>41</sup> The other two programs are the Chemical Demilitarization-Assembled Chemical Weapons Alternatives, and the Chemical Demilitarization-U.S. Army Chemical Materials Agency. According to the SAR for each program, O&S costs are reported in other sections of the reports. For example, program officials told us that O&S costs for the Assembled Chemical Weapons Alternatives program are captured in research, development, test, and evaluation costs. According to program officials, the Chemical Demilitarization program is a one-of-a-kind national environmental and safety program that is unlike weapon systems that report SARs. Further, officials said that the two programs have not separately reported any O&S costs since they were designated major defense acquisition programs in 1994.

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**Program Offices  
Sometimes Provided  
Unreliable Life-Cycle O&S  
Cost Estimates in Their  
SARs**

SARs are intended to provide Congress with authoritative program information on the cost, schedule, and performance of major weapon systems, but we found that some programs submitted unreliable O&S cost data. More specifically, our review of SAR reports for the 15 programs in our sample identified inaccurate cost estimates and other errors in SARs submitted in 2007, 2009, and 2010. (As noted earlier, DOD did not submit SARs in 2008.) While some of the program offices told us specific reasons for the errors, others did not provide an explanation.

Based on our analysis of O&S cost data reported in the SAR compared with the underlying cost estimates and other information provided by the program offices, we found that 7 of the 15 programs reported inaccurate O&S costs in one or more of the three annual SARs.

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<sup>41</sup> The O&S costs of the Apache Block IIIB are captured in the SAR for the Apache Block IIIA Remanufacture program. According to program officials, the programs were originally a single program but at milestone C the decision was made to split them into two separate programs. The Defense Acquisition Executive approved the reporting of O&S costs in the Apache Block IIIA Remanufacture SAR only. SARs for both programs note that the O&S costs are reported in the Apache Block IIIA Remanufacture SAR, but the costs are not broken out between the two programs.

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- The F-35 Joint Strike Fighter program office underreported the average cost per flying hour for the aircraft in the 2010 SAR. The average, steady-state O&S cost per flying hour was reported as \$16,425 (fiscal year 2002 dollars). Program officials told us that the number of aircraft used in the estimate for the Air Force's inventory was not accurate and the estimate also did not project for future cost growth above inflation. The estimate included approximately 528 extra aircraft that when calculating the average cost per flying hour, resulted in higher flight hours and lower average costs per hour. Further, according to the SAR, some of the F-35's O&S costs were intentionally excluded from the estimate to enable comparison with the antecedent system, the F-16 C/D. Costs for support equipment replacement, modifications, and indirect costs were removed from the F-35's cost per flying hour since they were not available for the F-16 C/D. Officials calculated that the revised cost per flying hour for the F-35 was \$23,557 (fiscal year 2002 dollars), or 43 percent higher, after including the excluded costs, projecting for future cost growth above inflation, and correcting the number of aircraft. However, they noted that the total O&S life-cycle cost reported in the SAR for the F-35 was accurate because it was calculated separately from the average cost per flying hour.
  - The Navy Multiband Terminal program office underreported estimated life-cycle O&S costs in the 2010 SAR. The program reported \$219.1 million in total O&S costs but excluded an additional \$591.3 million for externally funded depot-level repairables (\$148.4 million) and military personnel (\$442.9 million), which were included in a 2010 service cost estimate.<sup>42</sup> Therefore, only 27 percent of the program's estimated total O&S costs were reported in the 2010 SAR. Program officials stated that these costs are not under the control of the program office and should not be reported in the SARs. However, the SAR statute states that full life-cycle costs, including O&S costs, should be reported without regard to funding source or management control.
  - The Air Force Joint Primary Aircraft Training System program office underreported O&S costs in the 2007 and 2009 SARs, both of which were based on a 2001 service cost estimate. The program, which includes the T-6 aircraft and a ground-based training system, reported

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<sup>42</sup> The excluded costs in the service cost estimate were expressed only in then-year dollars, rather than constant dollars. Therefore, all cost figures in this example are presented in then-year dollars.

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total O&S costs of \$9.4 billion (fiscal year 2002 dollars) in both SARs but excluded \$2.1 billion (fiscal year 2002 dollars)—or about 18 percent—of O&S costs for the program’s ground-based training system. Program officials have reported the same O&S costs since the annual 2002 SAR. The program, which updated its O&S estimate in 2011, included these costs in the total O&S costs reported in the 2010 SAR.

- The Army’s High Mobility Artillery Rocket System program office overstated O&S costs in the program’s 2007, 2009, and 2010 SARs. Although program office estimates were provided to us for the 3 years, the estimates did not match the costs reported in the SARs. The O&S costs reported in 2007 were higher than the estimate by \$11.1 million (fiscal year 2003 dollars), and the \$988 million (fiscal year 2003 dollars), reported in both 2009 and 2010, was higher than the estimates by about \$300 million (fiscal year 2003 dollars), or about 43 percent. Program officials told us that the costs had been reported incorrectly in each year.
- The JTRS Handheld, Manpack, and Small Form Fit program underreported total O&S costs in the annual 2007 SAR. The SAR stated that the O&S costs had been updated, but the O&S costs were unchanged from prior annual SARs. Program officials also provided us with an estimate that matched the numbers reported in the 2007 SAR. When asked why the costs had not changed, program officials stated that while the costs for procurement and research, development, test, and evaluation were correctly updated in 2007, the O&S costs were not. They explained that the reported costs of \$4.9 billion (fiscal year 2004 dollars) should have been higher by \$120 million (fiscal year 2004 dollars), but they did not provide us the estimate on which that higher amount was based.
- The Air Force’s Navstar GPS program, as noted earlier, did not report a life-cycle cost estimate in the annual SARs from 2007 through 2010. For example, according to the 2010 SAR, the O&S costs reported were based on funding for fiscal years 2008 through 2016. Program officials confirmed that the O&S amounts reported included actual funding for the current year and funding from the Air Force’s budget system for the remaining years. However, even this amount—about \$469 million (fiscal year 2000 dollars) in 2010, for example—was significantly understated. According to program officials, the amount reported in the SAR is only 60 percent of the program’s actual requirements of approximately \$782 million—a difference of \$313 million—and the program has historically been funded to 90 percent of

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requirements with supplemental funds. However, this was not noted in the SARs.

- The FBCB2 program underreported total O&S costs in the annual 2007 through 2010 SARs. As explained earlier, reported O&S costs were estimated for the program's final acquisition milestone, full-rate production, in 2004. In subsequent years, however, the program's procurement quantities increased and were about 305 percent higher in the 2010 SAR than the amount used to develop the estimate. Further, total O&S costs of \$468 million (fiscal year 2005 dollars) reported in the SARs were \$129 million less than the \$596.2 million estimated in 2004. Officials initially indicated that some of the estimated O&S costs were likely included with the program's acquisition costs in the SAR, but they were unable to reconcile the costs in the two documents.

We also found examples of inaccuracies in other data reported in the O&S cost section of the SARs. For example, the 2010 SAR for the Joint MRAP states that the program's O&S costs were reviewed by CAPE in 2010, but program officials and prior-year SARs stated that the review actually occurred in 2008. Further, neither CAPE nor the program office was able to provide any record of the 2008 review. As another example, the 2010 SAR for the F-22 indicates that the reported O&S costs were based on a 2004 acquisition decision estimate that was updated with analyses from 2010 to bring the estimate in line with the current approved F-22 production program and operational concepts. However, the O&S costs reported are identical to those reported in the 2009 SAR, which states it was updated based on analyses from 2009.

Implementation of the GAO-identified best practices already discussed could improve the reliability of O&S costs reported in the SARs. Together, the best practices work to provide more assurance that the correct information is reported. For example, routinely updating O&S cost estimates—and related SAR data—will likely require more frequent changes to the reported cost data. Therefore, it is less probable that an error or omission will be regularly reported. In addition, as noted earlier, comparing a program's cost estimate with an independent cost estimate, and explaining any significant differences, could help decision makers monitor the reasonableness of the reported data. Finally, tracking O&S costs over time, by presenting the current year and prior-year program cost estimates and explaining significant differences, would also help to test the reasonableness of reported costs.

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## DOD Could Improve O&S Cost Reporting with Detailed Implementation Guidance and a More Effective SAR Review Process

DOD's reports to Congress on estimated weapon system O&S costs were often inconsistent and sometimes unreliable due to a lack of detailed implementation guidance for reporting these costs. In addition, DOD's process for reviewing the O&S cost sections of the SAR prior to final submission did not provide assurance that the program offices reported costs uniformly, to the extent practicable, and that these reported costs were reliable. In the absence of improvements to the SAR guidance and to DOD's review process, deficiencies in reporting estimated life-cycle O&S costs are likely to continue.

DOD's existing implementation guidance collectively provides minimal, and in some areas conflicting, instructions for O&S cost reporting. For example, the guidance does not identify which cost estimate or estimates should be used to report O&S costs when more than one estimate is available. Often multiple cost estimates are prepared by the program office, the service, and CAPE to support acquisition decisions. Further, DOD officials stated that O&S costs reported in the SAR should be updated only at acquisition milestones. Because many years may pass between these milestones, however, reported O&S costs may become outdated, no longer reflecting the status of the current acquisition program.

DOD's guidance also provides very little detail on how program offices should discuss assumptions underlying the cost estimate. DOD's draft SAR policy, for example, only mentions several assumptions for consideration, such as operating tempo, expected reliability and maintainability of the system, the maintenance concept, and manning and logistics policies, and does not provide specific examples. In addition, the statutory SAR requirement to report all program costs, regardless of funding source or management control, is reflected in none of DOD's SAR implementation guidance; it is reflected in training course materials on using the Defense Acquisition Management Information Retrieval system. Finally, DOD's draft SAR policy provides conflicting instructions on cost reporting for antecedent systems. The draft policy states that antecedent costs should be reported "whenever those costs have previously been developed." However, in the appendix, the draft guidance states that O&S costs will be reported for antecedent systems "when the replacement system is required to report O&S costs." DOD officials could not explain the reason for this variance in the guidance.

While some program offices we contacted indicated that DOD's implementation guidance on reporting O&S costs in the SAR was sufficient, officials from several program offices in our sample indicated

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that more detailed guidance would be helpful when they prepare their annual SAR submissions. These officials stated that there was minimal guidance provided on what should be included in the O&S narrative and that there needed to be more consistency in SAR O&S reporting. Additionally, they explained that the current guidance is vague, unclear, open to interpretation, and does not provide useful information or examples for how programs should be reporting these costs. Officials from one program also stated that there is no direction on the comparison of program costs to the antecedent system's costs, so the approach to making this comparison is open to interpretation. They noted that the guidance does not specify whether the program office should alter the weapon system's O&S costs to enable a true comparison with the costs for the antecedent system, or whether the weapon system's O&S costs should be reported without modification. Finally, while several program offices told us that the Defense Acquisition University provides useful training on acquisition reporting in general, they said that the materials should be more readily available as program representatives could not always attend the class and that the O&S section of the SAR was not covered sufficiently.

The SAR data submitted by program offices are subject to multiple reviews within the military services and by OSD, but this review process has not provided assurance that O&S costs are reported consistently and reliably. Although our review did not include a full evaluation of DOD's SAR review process, OSD officials explained that once they receive the SAR submissions, there is a relatively short amount of time to review the SAR O&S data. For example, according to the SAR review schedule, the Office of the Assistant Secretary of Defense (Logistics and Materiel Readiness) usually has about a week to review the O&S cost submissions. We also noted that "SAR review guidance" that is included with the annual memorandum on preparing SARs does not provide additional direction to the program offices on what to include in their O&S cost submissions. In some cases, the annual memorandum is less specific than the draft SAR policy. The deficiencies in DOD's implementation guidance likely hinder the effective review of SAR O&S cost information at all levels.

The department's emphasis on weapon system O&S costs has been increasing in recent years,<sup>43</sup> but the primary focus continues to be on

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<sup>43</sup> This increased emphasis is discussed in [GAO-10-717](#).

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acquisition costs. According to OSD acquisition officials, the SAR started as—and is still often viewed as—primarily an acquisition report. This perspective was reflected in comments from some program officials. For example, officials at one program office told us that, due to a constantly changing acquisition program, their time was largely spent on estimating acquisition costs. Another program office noted that the focus of the SAR statute was acquisition costs and that O&S costs will vary based on emerging needs. Several other programs indicated that O&S cost estimating was not particularly useful, as their systems had not yet entered into production or sustainment, and actual cost data were either not yet available or could not be obtained by the program office. Finally, other program offices stated that since they do not fund the support of the weapon system, the O&S cost estimates should be done by the organizations responsible for providing this funding.

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## Conclusions

Without more consistent and reliable reporting of estimated weapon system O&S costs, Congress and senior DOD officials may have limited visibility of information needed to effectively oversee the full life-cycle costs associated with weapon system acquisitions. Improvements in the reporting of these data could provide a more complete picture of the potential total financial commitment being made to these systems over a period lasting many decades. SAR cost estimates are reported early during acquisition, when there is the greatest chance for managing or reducing future O&S costs. By facilitating inquiries on changes from prior cost estimates and cost drivers, such information could affect acquisition investment decisions and result in tradeoffs that otherwise might not be considered. Furthermore, improvements to SAR reporting would be consistent with a provision in the National Defense Authorization Act for Fiscal Year 2012 directing DOD to take actions aimed at better assessing, managing, and controlling weapon system O&S costs.

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## Recommendations for Executive Action

To improve visibility over estimated life-cycle O&S costs during weapon system acquisition, we recommend that the Secretary of Defense take the following two actions.

First, we recommend that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics to revise DOD's guidance for implementing statutory SAR requirements. The

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revisions, at a minimum, should provide additional detail on the following areas:

- the explanatory information that should be included in the O&S narrative, including the specific assumptions underlying the cost estimate;
- the source to be used as the basis for reported O&S cost estimate information, especially when more than one source is available (such as a program office cost estimate, service cost estimate, and CAPE independent cost estimate);
- a consistent unit of measure for reporting average costs over time by commodity type—or other designated weapon system group—as agreed to by OSD and the services;
- criteria for identifying an antecedent system and reporting on the results of the cost comparison in the SAR; and
- reporting O&S costs for major modifications to existing weapon systems.

In revising the guidance, the Under Secretary of Defense should incorporate best practices for preparing and presenting cost estimates, including:

- a comparison of current-year to prior-year O&S cost estimates; the identification of cost drivers that resulted in changes in these estimates, if significant; and the level of detail that should be reported;
- a comparison of the reported cost estimate with the most recent independent cost estimate, along with an explanation of any significant differences between the two estimates; and
- The frequency with which O&S costs reported in the SAR should be updated, including guidance on what changes in the program's status should trigger an update.

Second, we also recommend that the Secretary of Defense direct that the Under Secretary of Defense for Acquisition, Technology and Logistics, in conjunction with the Secretaries of the Army, the Air Force, and the Navy, evaluate the current review process, identify any weaknesses, and institute corrective actions as needed to provide greater assurance that

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estimated life-cycle O&S costs included in the SAR reports submitted by program offices consistently follow the implementation guidance, including any revisions to the guidance as described above, and report reliable cost data. As part of this evaluation, DOD should consider whether additional steps are necessary for the department to enhance the emphasis placed on reporting estimated life-cycle O&S costs in the SAR.

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## Agency Comments and Our Evaluation

DOD provided comments on a draft of this report. In its comments, DOD agreed with both of our recommendations. The department's written comments are reprinted in appendix III. DOD also provided technical comments that we have incorporated into this report where appropriate.

In concurring with our first recommendation to revise DOD's guidance for implementing statutory SAR requirements, DOD noted that the focus of the SAR has always been primarily on acquisition rather than sustainment. DOD further stated that Congress, in requiring DOD to add O&S costs to the SAR report, did not intend for DOD to develop O&S costs for each submission but to report the latest available estimate for the program. Our report recognizes that the development of new O&S cost estimates is not required for each annual SAR submission. However, these costs represent a significant proportion of a system's total costs over its life cycle. Moreover, we found that the timing of updates to the O&S costs reported in the SAR varied widely, as DOD has not identified what changes in a program's status—other than established acquisition milestones, which can be many years apart—should trigger such updates. We also continue to believe that DOD needs to clearly identify the source and date of the O&S cost estimate data reported in the SAR. Our recommendations reflect these and other weaknesses in the current reporting of O&S costs.

DOD's comments identified actions it plans to take to implement our recommendations. DOD stated that it will expand and update its current guidance for the O&S cost section of the SAR, as contained in the *Defense Acquisition Guidebook*. DOD plans to make revisions specifically with regard to assumptions and ground rules (e.g., the source and date of the estimate reported); a consistent unit of measure for reporting O&S costs for each type of commodity; identifying, and reporting on, antecedent systems; and reporting O&S costs for major modifications. These planned revisions to the guidance are positive steps. We plan to monitor DOD's actions as part of our recommendation follow-up process.

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Regarding other revisions to the guidance that we recommend to incorporate best practices for O&S cost reporting, DOD stated that the department is not yet in a position to add a credible O&S cost variance analysis. Although DOD does not define what it means by "cost variance analysis," it is reasonable to expect that such analysis would involve comparing changes from a previous cost estimate and identifying any significant cost drivers. DOD noted that it is implementing new O&S-related requirements from the National Defense Authorization Act for Fiscal Year 2012, as well as previous requirements from the Weapon Systems Acquisition Reform Act of 2009, including requirements that deal with cost variance analysis. DOD stated that it is premature to determine to what extent DOD's implementation of these requirements will affect the reporting of O&S costs in the SAR. With these and other ongoing activities related to the management and control of O&S costs, DOD would prefer to defer these additional reporting requirements for the SAR for now.

We are aware that DOD has a number of ongoing activities to improve the management and control of O&S costs and must respond to several new requirements, as stated in DOD's comments. For example, the O&S-related guidance required by the National Defense Authorization Act for Fiscal Year 2012 must be issued within 180 days from the date the Act was enacted, which was December 31, 2011. If such activities result in improved visibility of O&S costs within the department, and DOD coordinates these activities with efforts to improve O&S cost reporting in the SAR, then we agree that it may be preferable to delay implementation of the best practices we recommend in our report. However, we continue to believe that these best practices, when implemented, will provide better information on the current status and direction of long-term O&S costs and thus can improve congressional oversight of weapon system costs. Therefore, these elements of our recommendation remain valid.

DOD also concurred with our second recommendation to evaluate and make any changes needed to strengthen its current process for reviewing O&S cost reporting prior to submission of SARs to Congress. In its comments, DOD cited actions it would take in the short term to improve the review of O&S costs prior to submission of SAR reports at the end of March 2012. DOD stated that the O&S cost section will be given additional emphasis during this reporting period. Subsequently, DOD will convene a joint OSD/DOD component working group that will evaluate the current SAR review process, identify any weaknesses, and institute corrective actions as needed to improve the data quality for the estimated

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life-cycle O&S costs reported in the SAR. We believe these actions, when implemented, will meet the intent of our recommendation.

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We are sending copies of this report to interested congressional committees; the Secretary of Defense; the Secretaries of the Army, the Navy, and the Air Force; the Acting Under Secretary of Defense for Acquisition, Technology and Logistics; and the Director, Office of Management and Budget. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions concerning this report, please contact me at (404) 679-1808 or [russellc@gao.gov](mailto:russellc@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors are listed in appendix IV.

A handwritten signature in black ink that reads "Cary Russell". The signature is written in a cursive style with a large initial "C" and a long, sweeping tail.

Cary B. Russell  
Acting Director, Defense Capabilities and Management

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# Appendix I: Scope and Methodology

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To determine the extent to which the selected acquisition reports (SAR) provide consistent and reliable operating and support (O&S) cost estimate information that enables effective oversight of major weapon system costs, we reviewed statutory requirements in 10 U.S.C. § 2432 for reporting weapon system life-cycle costs in the SARs, as well as Department of Defense (DOD) implementation guidance for the SAR. We also reviewed DOD guidance for preparing weapon system O&S costs and GAO-identified cost-estimating best practices to identify the scope and nature of cost estimate information needed for effective program management and oversight.

We interviewed and obtained documentation from DOD and military service officials responsible for weapon system acquisition, logistics, and cost analysis to understand DOD's approach and process for reporting O&S cost estimates in the SARs. Offices we contacted included the following:

- Office of the Under Secretary of Defense for Acquisition, Technology and Logistics
  - Office of the Director, Acquisition Resources and Analysis
  - Office of the Deputy Assistant Secretary of Defense for Materiel Readiness
- Office of the Director, Cost Assessment and Program Evaluation
- Office of the Deputy Assistant Secretary of the Army, Cost and Economics
- Naval Center for Cost Analysis
- Air Force Cost Analysis Agency

We obtained SARs for all 95 weapon systems that reported a December 2010 SAR.<sup>1</sup> These reports were contained in the Defense Acquisition Management Information Retrieval system, which is a web-based system used within DOD to collect and maintain SAR information submitted by program offices. We determined that the data in this system accurately reflected information submitted by weapon system program offices and therefore were sufficiently reliable for the purposes of our analysis. After determining that a total of 84 of the 95 weapon systems included O&S costs in their December 2010 SARs, we analyzed the annual SARs that

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<sup>1</sup> Although a total of 96 programs submitted a SAR in 2010, the Ballistic Missile Defense Program had not yet reached milestone B and thus was not required to report O&S costs. For this reason, we did not include this program in our analyses.

were submitted for these systems between 2005 through 2010.<sup>2</sup> Specifically, we analyzed the SARs to determine the types and scope of explanatory information included in the O&S narrative accompanying the cost estimate data; the source of the O&S cost estimate cited as the basis for the reported costs; the units of measure used to present O&S costs; the frequency that O&S costs were updated from year to year; and the extent to which O&S costs for antecedent systems were reported. We compared the SARs across each of these categories to determine the extent to which information was reported consistently across all 84 weapon systems.

From the population of 84 weapon systems that included O&S cost estimates in the 2010 SARs, we selected a sample of 15 weapon systems for further analysis.<sup>3</sup> We designed the sample to ensure that a range of weapon systems were represented based on commodity type and service responsible for managing the program. We selected three or four weapon systems per service and at least one commodity type within each service for a total sample size of 15.<sup>4</sup> We also examined the distribution of weapon systems' total costs across our sample selection in terms of both dollars and the upper and lower 50 percent of weapon systems that reported O&S costs in the 2010 SAR. We determined that the sample contained an adequate mix of high- and low-dollar weapon systems for our purposes. The results from this nonprobability sample cannot be used to make inferences about all major weapon systems because the sample may not reflect all characteristics of the population. The 15 programs in our sample are shown in table 3.

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<sup>2</sup> Annual SARs are submitted to Congress within 60 days after the date on which the President's Budget is submitted to Congress for the following fiscal year. We analyzed the December SARs for the years 2005, 2006, 2007, 2009, and 2010. Annual SARs were not submitted in 2008.

<sup>3</sup> Our original sample included 16 weapon systems. However, one system, the Army's Increment 1 Early-Infantry Brigade Combat Team program, was subsequently canceled.

<sup>4</sup> We categorized systems as aircraft, ship, ground, or "other" (e.g., missile programs and command and control systems).

**Table 3: Major Weapon Systems in GAO's Nonprobability Sample**

Service	Major weapon system	Commodity type
Army	1. Force XXI Battle Command Brigade and Below	Other
	2. High Mobility Artillery Rocket System	Other
	3. MQ-1C Unmanned Aircraft System Gray Eagle	Aircraft
Navy	4. Joint Mine Resistant Ambush Protected	Land
	5. LHA 6 America Class	Ship
	6. Navy Multiband Terminal	Other
	7. V-22 Joint Services Advanced Vertical Lift Aircraft (Osprey)	Aircraft
Air Force	8. F-22 Raptor	Aircraft
	9. Joint Primary Aircraft Training System	Aircraft
	10. Navstar Global Positioning System	Other
	11. National Polar-orbiting Operational Environmental Satellite System	Other
DOD	12. Airborne and Maritime/Fixed Station Joint Tactical Radio System	Other
	13. F-35 Joint Strike Fighter	Aircraft
	14. Joint Tactical Radio System Ground Mobile Radios	Other
	15. Joint Tactical Radio System Handheld, Manpack, and Small Form Fit	Other

Source: GAO analysis of 2010 SAR data.

Through a data collection instrument, interviews, and other contacts, we obtained information from the 15 program offices on the O&S costs they had reported in the SAR, including the cost estimates, where available, that formed the basis for their reported costs. We compared the cost estimates used to develop SAR O&S costs, as well as any additional cost estimates that had been developed for the weapon systems, to the O&S costs reported in the SARs. We interviewed program officials about the reasons for any discrepancies we identified between the SAR O&S costs and the cost estimates. For those weapon systems that did not include O&S cost estimates in the 2010 SARs, we contacted the individual program offices to obtain information about the reasons why these costs were not included. These programs are listed in table 2 of the report.

We conducted this performance audit from February 2011 to February 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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# Appendix II: DOD's Guidance Implementing the Statutory SAR Requirements

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This appendix provides additional information on DOD's guidance that implements the statutory SAR requirements in 10 U.S.C. § 2432.

DOD has issued various guidance documents that implement the statutory SAR requirements. DOD Instruction 5000.02,<sup>1</sup> which addresses the operation of the defense acquisition system, includes guidance on SARs that is similar to the basic statutory requirements in 10 U.S.C. § 2432. The guidance, for example, states that SARs should be submitted at program initiation (normally milestone B except for some ship programs) or at the time that the program is designated as a major defense acquisition program. It reiterates that programs shall report annually, with the exception of quarterly reports that are required when acquisition costs increase or schedules slip. Further, the instruction requires the submission of quarterly SARs after the program rebaselining that occurs after a major milestone decision (i.e., milestone C or milestones B and C for some ship programs).

Another source of guidance on SAR reporting is the *Defense Acquisition Guidebook*,<sup>2</sup> which describes discretionary best practices for acquisition professionals to consider while meeting various reporting requirements throughout the acquisition process. The guidebook contains a section summarizing the statutory requirements for SAR content and submission and reiterates that a full life-cycle analysis of costs should be reported for programs, including each evolutionary increment, as available, and for antecedent programs, if applicable.

DOD's SAR policy,<sup>3</sup> issued in draft in 2006 and never finalized, further identifies information that should be included in the O&S cost section of the SAR. According to the draft policy, programs that have reached milestone B should report the most recent estimate of O&S costs, such as those developed for service cost reviews and acquisition milestone decisions, and should include both the source and date of this estimate in the SAR. Average annual O&S costs should be reported in constant, base-year dollars in a unit of measure (for example, cost per aircraft, squadron, or wing) determined by the service. The draft policy further

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<sup>1</sup> DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Dec. 8, 2008).

<sup>2</sup> DOD, *Defense Acquisition Guidebook* (2011).

<sup>3</sup> OSD, *Selected Acquisition Report* (draft) (2006). Although issued in draft, the policy was never issued in final form.

states that assumptions underlying the estimate should be included. Operating tempo, expected reliability and maintainability of the system, maintenance concept, and manning and logistics policies are provided as examples of the estimate assumptions that should be included in the SAR. Finally, the draft policy states that programs should report the total estimated O&S costs, and estimate assumptions, for an antecedent system if one has been identified and these costs were previously developed for that system.

Each year the Under Secretary of Defense for Acquisition, Technology and Logistics issues a memorandum to the military services that provides guidance for preparing the annual SARs, including instructions for programs that have reached milestone B and are required to report O&S costs.<sup>4</sup> For fiscal years 2007, 2009, and 2010, this annual guidance states that programs should report total estimated O&S costs in both constant and then-year dollars, and that the assumptions that formed the basis of the estimate and the date of the estimate should be included. Further, programs should report an average unit of measure (e.g., average annual cost per squadron, average annual cost per system) for the O&S costs of both the current weapon system and the antecedent system in constant dollars. If there is no antecedent system, this should be stated in the narrative of the O&S cost section. If there is an antecedent system but the data are not currently available, the antecedent system should be identified in the narrative, along with a statement that the required data are not available (e.g., "the O&S costs for the antecedent system are not currently available, but will be provided in the next SAR"). Finally, programs should explain in the narrative how the average annual costs were calculated using the estimated O&S cost total.

Finally, DOD has developed instructions<sup>5</sup> and training for entering SAR data into the Defense Acquisition Management Information Retrieval system. DOD instructions for entering SAR data into the system generally align with the 2006 draft policy. The Defense Acquisition University offers

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<sup>4</sup> At the time we conducted our review, the most recent annual guidance was issued in January 2011. Under Secretary of Defense for Acquisition, Technology and Logistics, Memorandum for Assistant Secretaries of the Military Services, *December 2010 Selected Acquisition Reports (SARs) Guidance* (Jan. 14, 2011).

<sup>5</sup> Under Secretary of Defense for Acquisition, Technology and Logistics, *SAR Data Entry Instructions (draft)* (Nov. 5, 2010).

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SAR training on using this system. According to Office of the Secretary of Defense (OSD) officials, the primary class, Acquisition Reporting for Major Defense Acquisition Programs and Major Automated Information Systems, is usually offered in January and October. During the 4-day class, participants receive step-by-step instruction on report preparation using the system's web application. The training materials include basic SAR O&S cost reporting information. For example, estimate assumptions should be reported, calculation of average costs from total O&S costs should be provided, and costs should always be updated at major acquisition milestones. The training materials reiterate that costs should include both direct and indirect costs, regardless of funding source or management control.

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# Appendix III: Comments from the Department of Defense

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LOGISTICS AND  
MATERIEL READINESS

ASSISTANT SECRETARY OF DEFENSE  
3500 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3500

JAN 27 2012

Mr. Cary B. Russell  
Director, Defense Capabilities and Management  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

Dear Mr. Russell:

This is the Department of Defense (DoD) response to the GAO draft report GAO-12-340, "DEFENSE LOGISTICS: Improvements Needed to Enhance Oversight of Estimated Long-Term Costs for Operating and Supporting Major Weapon Systems," dated December 21, 2011 (GAO Code 351582). Detailed comments on the report recommendations are enclosed.

Sincerely,

Alan R. Estevez

Enclosure:  
As stated

GAO DRAFT REPORT DATED DECEMBER 21, 2011  
GAO-12-340 (GAO CODE 351582)

“DEFENSE LOGISTICS: IMPROVEMENTS NEEDED TO ENHANCE OVERSIGHT  
OF ESTIMATED LONG-TERM COSTS FOR OPERATING AND SUPPORTING  
MAJOR WEAPON SYSTEMS”

DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATIONS

**RECOMMENDATION 1:** To improve visibility over estimated life-cycle O&S costs during weapon system acquisition, GAO recommends that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics to revise DoD's guidance for implementing statutory SAR requirements. The revisions, at minimum, should provide additional detail regarding the following areas:

- The explanatory information that should be included in the O&S narrative, including the specific assumptions underlying the cost estimate.
- The source to be used as the basis for reported O&S cost estimate information, especially when more than one source is available (such as a program office cost estimate, service cost estimate, and CAPE independent cost estimate).
- A consistent unit of measure for reporting average costs over time by commodity type – or other designated weapon system group – as agreed to by OSD and the services.
- Criteria for identifying an antecedent system and reporting on the results of the cost comparison in the SAR.
- Reporting O&S costs for major modifications to existing weapon systems.

In revising the guidance, the Under Secretary of Defense should incorporate best practices for preparing and presenting cost estimates, including:

- A comparison of current year to prior year O&S cost estimates; the identification of cost drivers that resulted in changes in these estimates, if significant; and the level of detail that should be reported.
- A comparison of the reported cost estimate with the most recent independent cost estimate, along with an explanation of any significant differences between the two estimates.
- The frequency with which O&S costs reported in the SAR should be updated, including guidance on what changes in the program's status should trigger an update.

**DoD RESPONSE:** Concur with comment. Since 1969, when the Department first began submitting Selected Acquisition Reports to Congress, the report has always been primarily an acquisition, not a sustainment, report. When Congress added O&S costs to the SAR in 1985, it was made clear in the legislative history that the Department should not develop O&S cost estimates for each submission but report the latest available estimate for the program. Unlike the

acquisition portion of the SAR that is updated with each submission to reflect actual costs expended, funds budgeted, and current projections of costs to go, the O&S section of the SAR reports only estimates of O&S costs. Therefore, since inception, the O&S costs in the SAR represent the latest available estimate from the DoD cost community.

The Department concurs with the GAO recommendation to expand and update the current guidance for the O&S cost section of the SAR, which is contained in the Defense Acquisition Guidebook (DAG). DoD will revise this guidance for the DAG to include the following:

- More specific direction as to what to include in Assumptions and Ground Rules (e.g., source and date of estimate reported).
- A consistent unit of measure for unitizing O&S costs for each commodity. *[The December 2011 SAR guidance has already directed that DoD Components transition to uniform units of measure for each commodity.]*
- Additional criteria for identifying and reporting antecedent systems. *[DoD will retain the longstanding definition of an antecedent being one that is replaced by the weapon system.]*
- Reporting O&S costs for major modifications. *[The guidance will reflect our current practice of only reporting significant differential O&S costs for modification programs.]*

However, the Department is not in a position to add a credible O&S cost variance analysis to the SAR at this time. DoD is currently implementing detailed O&S – related legislation contained in Section 832 of the FY 2012 National Defense Authorization Act (NDAA) and previously from the Weapon Systems Acquisition Reform Act of 2009. A portion of this legislation deals with recording the reasons for O&S cost variances, as well as the requirement for establishing periodic updates of O&S cost estimates throughout the life cycle of a weapon system. It is premature to determine to what extent DoD's implementation of this new legislation will involve the pre-existing requirement for reporting O&S costs in the SAR. There is a wide range of ongoing activities related to the management and control of O&S costs that exist within or internal to the Department. In order to reduce any duplicative efforts, we would prefer to defer these additional reporting requirements for the SAR for now.

**RECOMMENDATION 2:** GAO also recommends that the Secretary of Defense direct that the Under Secretary of Defense for Acquisition, Technology, and Logistics, in conjunction with the Secretaries of the Army, the Air Force, and the Navy, evaluate the current review process, identify any weaknesses, and institute corrective actions as needed to provide greater assurance that estimated life-cycle O&S costs included in the SAR reports submitted by program offices consistently follow the implementation guidance, including any revisions to the guidance as described above, and report reliable cost data. As part of this evaluation, DoD should consider whether additional steps are necessary for the department to enhance the emphasis placed on reporting estimated life-cycle O&S costs in the SAR.

**DoD RESPONSE:** Concur. The Department is continually seeking to improve the review processes for the SAR. For the December 2011 SAR reporting period, we plan to have an O&S

subject matter expert from the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness attend each of the joint Office of the Secretary of Defense (OSD)/DoD Component program reviews. These detailed reviews will be conducted in early March 2012 to incorporate all OSD comments into the SARs prior to their submission to Congress on March 29, 2012. The O&S cost section will be given additional emphasis during this reporting period.

Subsequent to the issuance of updated SAR guidance and the lessons learned from the increased focus on O&S costs reported in the December 2011 SARs, the Department will convene a Joint OSD/DoD Component working group that will evaluate the current SAR review process, identify any weaknesses, and institute corrective actions, as needed, to improve data quality for the estimated life cycle O&S costs reported in the SAR.

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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

Cary B. Russell, (404) 679-1808 or russelc@gao.gov

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## Staff Acknowledgments

In addition to the contact name above, the following staff members made key contributions to this report: Tom Gosling, Assistant Director; Kristine Hassinger; Susannah Hawthorne; Charles Perdue; Janine Prybyla; William M. Solis; and Erik Wilkins-McKee.

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