

**GAO**

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

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May 2009

# DEPOT MAINTENANCE

## Actions Needed to Identify and Establish Core Capability at Military Depots



**GAO**

Accountability \* Integrity \* Reliability

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Highlights of [GAO-09-83](#), a report to the Subcommittee on Readiness, Committee on Armed Services, House of Representatives

## Why GAO Did This Study

The Department of Defense (DOD) is required, by law, to maintain a core logistics capability that is government owned and government operated to meet contingency and other emergency requirements. Military depots play a key role in maintaining this “core capability,” although in recent years DOD has significantly increased its use of contractors. At the subcommittee’s request, GAO examined the extent to which

- (1) DOD has accurately assessed whether it has the required core capabilities in military depots and
- (2) DOD is preparing to support future core requirements for new and modified systems.

GAO reviewed DOD’s biennial process for determining core capability requirements and the associated workloads for fielded systems. GAO also reviewed whether DOD had identified and established core capability in a timely manner for new and modified systems.

## What GAO Recommends

GAO is making eight recommendations to DOD to improve its core biennial process to provide more comprehensive and accurate assessments, and to improve the timely identification and establishment of core capabilities for new and modified systems. DOD generally agreed with GAO’s recommendations. DOD partially concurred with a recommendation to enhance reporting to Congress, and GAO replaced this recommendation with a matter for congressional consideration.

[View GAO-09-83 or key components.](#)

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## DEPOT MAINTENANCE

### Actions Needed to Identify and Establish Core Capability at Military Depots

#### What GAO Found

DOD, through its biennial core process, has not comprehensively and accurately assessed whether it has the required core capability to support fielded systems in military depots. Although DOD internally reported that its maintenance workload of 92.7 million hours in 2007 was “well over” the minimum of 70.5 million hours needed to fulfill core requirements at military depots and that the services were complying with their core capability requirements, this assessment did not show capability shortfalls identified by the services in their core computations. GAO’s analysis of the services’ 2007 core capabilities data determined that the Army, Navy, and Marine Corps had shortfalls for some equipment categories or technologies. For example, the Army identified core shortfalls of 1.4 million hours for 10 equipment categories. Several factors contributed to the deficiencies in the core process. Current guidance does not address how DOD is to consolidate the services’ results into a meaningful department wide assessment. Also, there were errors and inconsistencies in the services’ core calculations, making the full extent of the shortfalls unclear, and DOD also did not have effective internal controls in place to identify and resolve these errors and deficiencies. Further, DOD’s core process does not have an effective mechanism for ensuring that corrective actions are taken to resolve shortfalls for fielded systems. As a result of shortcomings in the core process, DOD does not know the extent to which the military depots will have the capability to repair weapon systems to support future military operations. Finally, since DOD is not required to provide Congress information on its core process, the results of the process are not readily and routinely visible for purposes of congressional oversight.

DOD is not adequately preparing military depots to support future core requirements through its acquisition process. Specifically, for the new and modified systems included in our review, the department had neither identified nor established core capabilities for certain systems in a timely manner. DOD acquisition guidance requires that an analysis of core requirements for new and modified systems be conducted early in the acquisition phase (no later than Milestone B or no later than Milestone C if there is no Milestone B). However, GAO found that program offices managing 20 of 52 systems we reviewed did not identify core requirements by Milestone C. DOD is also not establishing core capabilities for new and modified systems in a timely manner—that is, within 4 years of the system’s achieving its initial operational capability, as required under DOD guidance. Shortcomings in the acquisition process include (1) acquisition guidance provides little or no information on how to identify and plan for the establishment of core capability, (2) program acquisition strategies do not fully address core requirements, and (3) some program offices are not procuring technical data necessary to establish a core capability. As a result, DOD has little assurance that the department is preparing military depots to meet future national defense contingencies.

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Figure 1: Number of Systems Identified Where Program Offices Prepared Core Logistics Analysis in Each Phase of the Acquisition Process

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United States Government Accountability Office  
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May 14, 2009

The Honorable Solomon P. Ortiz  
Chairman  
The Honorable J. Randy Forbes  
Ranking Member  
Subcommittee on Readiness  
Committee on Armed Services  
House of Representatives

The Department of Defense (DOD) maintains a multitude of complex weapon systems including aircraft, ships, ground-based systems, missiles, communications equipment, and other types of electronic equipment that require regular and emergency maintenance to keep pace with national security goals. This mix of weapon systems and their maintenance needs is continually changing as new weapon systems replace older ones and systems in the field are modified with newer and better technologies to meet changing threats. To sustain all these systems, at the depot level,<sup>1</sup> the military uses a combination of private sector contractors and military depots. Depots play a key role in maintaining military systems and equipment in peacetime and during surge conditions like those created by the ongoing conflicts in Iraq and Afghanistan. However, in recent years DOD has significantly increased its use of contractors to support military systems and equipment.

Recognizing the important role of military depots in supporting U.S. forces and the risk of over-reliance on private contractors for vital military needs, Congress in 1984 enacted legislation whereby certain core logistics activities identified by the Secretary of Defense were first exempted from being contracted out.<sup>2</sup> The statute was later codified at Section 2464 of Title 10, U.S. Code, and has been amended several times since that date. The core logistics capability statute<sup>3</sup> states, in part:

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<sup>1</sup> Depot maintenance is the highest level of maintenance within DOD and generally refers to major maintenance and repair actions.

<sup>2</sup> Pub. L. No. 98-525, § 307 (1984). This section was originally codified at 10 U.S.C. § 2304 (note).

<sup>3</sup> 10 U.S.C. § 2464.

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“It is essential for the national defense that the Department of Defense maintain a core logistics capability that is Government-owned and Government-operated (including Government personnel and Government-owned and Government-operated equipment and facilities) to ensure a ready and controlled source of technical competence and resources necessary to ensure effective and timely response to a mobilization, national defense contingency situations, and other emergency requirements.”

Under the core statute, the Secretary of Defense is charged with identifying the core logistics capabilities described in the statute, as well as the workload required to maintain those capabilities. These “core logistics capabilities” identified by the Secretary of Defense must include those capabilities that are necessary to maintain and repair the weapon systems and other military equipment<sup>4</sup> that are identified by the Secretary of Defense, in consultation with the Chairman of the Joint Chiefs of Staff (JCS), as necessary to enable the armed forces to fulfill the strategic and contingency plans prepared by the Chairman, JCS.<sup>5</sup> The statute also states that the Secretary of Defense shall require the performance of core logistics workloads necessary to maintain these identified core logistics capabilities at government-owned, government-operated DOD facilities (military depots) and assign these facilities sufficient workload to ensure cost efficiency and technical competence in peacetime, while preserving surge capacity and reconstitution capabilities necessary to support fully the strategic and contingency plans referenced in the statute. The statute further stipulates that core workloads needed to maintain a logistics capability identified by the Secretary of Defense may not be contracted to the private sector unless the Secretary of Defense has executed a waiver. According to DOD officials, they have no record of a waiver being requested.

DOD implements this statutory requirement to retain core capabilities and workloads through a two-pronged process that includes the biennial core capability determination process (for fielded systems) and the acquisition

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<sup>4</sup> The statute excludes systems and equipment that are under special access programs, nuclear aircraft carriers, and commercial items that have been sold or leased in substantial quantities to the general public and are purchased without modification in the same form that they are sold in the commercial marketplace, or with minor modifications to meet federal government requirements. We did not review systems and equipment that were excluded based on exceptions provided for in the statute.

<sup>5</sup> Pursuant to Section 153(a) of Title 10, U.S. Code, JCS prepares representative contingency scenarios for which the U.S. military forces should be manned, equipped, and trained to respond.

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process (for new systems and systems undergoing modification). In the case of fielded systems, DOD has issued guidance that outlines a biennial core determination process and provides a computational methodology to identify essential DOD depot maintenance core capability requirements for each DOD component, as well as the workloads needed to sustain those capabilities.<sup>6</sup> The core determination process expresses core capability requirements and planned workload in direct labor hours. DOD guidance also requires the Deputy Under Secretary of Defense for Logistics and Materiel Readiness to collect, review, and evaluate service submissions as applicable, and compute the composite core capability requirements and associated workloads for DOD. The results of the process are summarized in an internal report that shows overall DOD core requirements and associated workloads and are then submitted for approval to the Under Secretary of Defense for Acquisition, Technology, and Logistics. For new systems and systems undergoing modification, the identification of core requirements is to occur during the acquisition process, and DOD has established a time frame for performing a core analysis that is linked with major acquisition milestones. Furthermore, DOD guidance requires that for systems that are identified as necessary to fulfill core requirements, DOD has the capability to maintain and repair these systems at a military depot within 4 years of a system's initial operational capability.

The House Armed Services Committee's Readiness Subcommittee requested that we review whether DOD is identifying and establishing required core capability for systems that are currently fielded as well as for new and modified systems. In response to this request, we examined the extent to which (1) DOD has accurately assessed whether it has the required core capabilities in military depots to support fielded systems and (2) DOD is preparing to support future core requirements for new and modified systems in military depots.

To assess the core determination process for fielded systems, we focused on the 2007 core process, which began in 2005. We reviewed the military services' implementation of the core determination methodology and compared the results of their process with the summary report compiled by Office of the Secretary of Defense (OSD). We also discussed the core determination process and our data analyses with OSD and service

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<sup>6</sup> Capability is the combination of skilled personnel, facilities, equipment, processes, and technology needed to perform a particular category of work (e.g., composite repair), and that are necessary to maintain and repair the weapon systems and other military equipment needed to fulfill strategic and contingency plans.

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officials. In reviewing the identification of core capability for new and modified systems, we selected 52 program offices that had completed a core analysis. We surveyed these program offices on how and when they determined core capability requirements for their respective weapon systems. Further, to determine whether core capability had been established for new and modified systems as required under DOD guidance, we identified systems that had completed the acquisition process and were in operation between 1998 and 2003. We initially selected 73 systems for this part of our review and ultimately focused on 30 of these systems. For these systems we reviewed various program documents, including source-of-repair decisions and maintenance plans, and interviewed program officials about the characteristics of the systems and maintenance sustainment. We assessed the reliability of the data from the services' databases that we used to conduct our studies and determined that the DOD data were sufficiently reliable for the purposes of our analysis and findings. While the results of these reviews cannot be generalized to all weapon systems in the acquisition process, deficiencies in the way core capability is identified or established for these systems indicate the existence of more widespread problems. Further, we did not look at the larger question of whether DOD fulfilled the warfighter's requirements as part of our review. We conducted this performance audit from June 2007 through March 2009 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 the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. A more detailed description of our scope and methodology is included in appendix I.

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## Results in Brief

DOD, through its core process, has not comprehensively and accurately assessed whether it has the required core capability to support fielded systems in military depots. Although DOD internally reported that it had the overall required core capability to support its 2007 core requirements, three of the four military services identified core capability shortfalls within their respective service in specific categories of equipment and technology. Core capability shortfalls, as measured in direct labor hours, exist when planned workload is not sufficient to meet core requirements. When shortfalls occur, DOD may not have the necessary capability to repair weapon systems, which could affect the readiness of troops that rely on these weapon systems that support future military operations. DOD's internal report on the results of the 2007 core process stated that



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the department's planned maintenance workload of 92.7 million hours was "well over" the minimum of 70.5 million hours needed to fulfill core requirements at military depots and that the services were complying with their core capability requirements.

While DOD's assessment showed that depots had more than enough core capability workload in the aggregate to meet core requirements, it did not discuss the specific capability shortfalls that had been identified within three of the four services in their respective core computations. OSD officials initially told us they were aware only of the Marine Corps' shortfalls, but not the Army's and Navy's. However, when we brought the results of our analysis to their attention, they acknowledged that these two services also had identified shortfalls. The officials noted, however, that shortfalls in specific equipment/technology categories could be offset if one service had sufficient depot repair capability to support the core requirements for another service. However, since OSD officials were unaware that some services had shortfalls at the time they assessed core capability, it is unknown whether OSD could have made this offset determination. Our analysis of the services' 2007 core capabilities data showed that the Army, Navy, and Marine Corps had identified shortfalls for several equipment/technology categories. Of these three services, the Army identified the greatest core shortfalls—a total of 1.4 million direct labor hours spread across 10 equipment/technology categories. We identified several factors that contributed to deficiencies in the core process. Current guidance does not address how DOD is to consolidate the service's results into a meaningful departmentwide assessment. Also, there were errors and inconsistencies in the services' core calculations, making the full extent of the shortfalls unclear. For example, we found problems in the way one or more of the services excluded certain JCS scenario-tasked systems from their core calculations, excluded software maintenance, and factored in private sector maintenance workloads. DOD did not have effective internal controls to prevent these errors and inconsistencies. In addition, the Air Force used a methodology for calculating core capability shortfalls that differed from the methodology used by the other services.

Although DOD core guidance provides instructions for determining core requirements and associated workload, it does not specify how to calculate shortfalls based on the worksheets developed by each service. Further, DOD's core process lacked an effective mechanism for ensuring that corrective actions were taken to resolve core capability shortfalls for fielded systems. Some shortfalls in specific equipment/technology categories persisted between 2005 and 2007. DOD subsequently issued

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guidance that requires the services to develop mitigation plans to address core capability shortfalls for 2009. However, this guidance falls short of establishing an effective mechanism to ensure that shortfalls are corrected. As a result of shortcomings in the core process, DOD does not know the extent to which the military depots have the required capability to provide an effective and timely response to national defense contingencies and other emergency requirements. Finally, because DOD is not required to provide Congress information on its core process, the results of the core process are not readily and routinely visible for purposes of congressional oversight.

With regard to new and modified systems, DOD is not adequately preparing military depots to support future core requirements through its acquisition process. More specifically, for many of the new and modified systems included in our review, the department had neither performed a core capability analysis nor established capabilities to maintain and repair those systems in a timely manner. DOD acquisition guidance requires that a core logistics analysis for new and modified systems be conducted no later than Milestone B (the second major decision point in the acquisition process), or no later than Milestone C if there is no Milestone B for that system. However, for the systems we reviewed, this analysis did not normally happen until later in the acquisition cycle. Specifically we found that program offices managing 20 of the 52 systems we reviewed did not identify core requirements by Milestone C. For example, a core analysis for the Army's Stryker Family of Vehicles and the Air Force's Mobile Approach Control System were not completed until after Milestone C, by which time the systems were already in the production and deployment or operations and support phases.

According to DOD officials, if core capability requirements for new and modified systems have not been identified early in the acquisition process, it is unlikely that core capability can be established at military depots within 4 years of initial operational capability, as required by DOD guidance. We found that DOD was not establishing identified core capabilities for new and modified systems in a timely manner—that is, within the 4-year time period. As one example, the Navy's Air Launched Expendable-50 system, which provides an electronic countermeasure method against anti-aircraft missile threats, reached initial operational capability in 2002 and has been maintained by a contractor because the Navy has not made the funds available to establish the required depot capability by 2006. DOD has not adequately addressed core requirements for new and modified systems because of three shortcomings in the acquisition process. First, acquisition guidance provides little to no

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information on how to identify and plan for the establishment of core capability. Recognizing the importance of early decision making to the establishment of core capability, since 2006 the Air Force has required program offices to conduct an initial core assessment prior to the core analysis that is required by DOD guidance. The intent of this requirement is to allow for an early evaluation of the system's sustainment concept. This initial core assessment appears to be a promising practice to support the timely establishment of core capability. Second, program offices' acquisition strategies do not fully address core requirements. Our review of acquisition strategies for 11 major acquisition programs determined that this key acquisition documentation only provided a statement of the need to address core capability but did not provide a plan for how to establish it. Third, some program offices did not procure technical data necessary for the establishment of core capability. We have identified the technical data issue in the past, and Section 802(a) of the National Defense Authorization Act for Fiscal Year 2007 required that DOD give greater consideration to long-term technical data needs, but it is too soon to know what impact this will have on acquiring the required data to establish core capability. As a result of the deficiencies in the acquisition process regarding core capability, DOD has little assurance that the services are preparing to provide maintenance capabilities in their military depots to meet future maintenance requirements for new and modified systems.

We are recommending that DOD modify its core determination process to provide more comprehensive and accurate biennial assessments of core capability for fielded systems and to correct identified shortfalls. We are also making several recommendations to improve the timely identification and establishment of core logistics capabilities for new and modified systems. In its written comments on a draft of this report, DOD generally concurred with our recommendations. DOD partially concurred with a recommendation in our draft report that it provide Congress visibility on the results of the core determination process. The department stated that it plans to make the results of the core determination process available on a DOD Web site. However, DOD was opposed to generating reports to Congress which it has not requested. As we state in the report, Congress does not have readily available and routine visibility of the status of DOD's core capability, including core requirements, associated workloads, and shortfalls, if any exist. Therefore, we have replaced this recommendation with a matter for congressional consideration.

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## Background

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### Concept of Core Logistics Capability

To ensure core capability is maintained, Congress enacted Section 2464 of Title 10, which requires, in part, that the Secretary of Defense maintain a core logistics capability that is government owned, government operated, and that uses government personnel, equipment, and facilities. The authority and responsibility of the Secretary of Defense under Section 2464 has been delegated to the Under Secretary of Defense for Acquisition, Technology, and Logistics.<sup>7</sup> Statutory guidance and DOD's implementing guidance are aimed at ensuring that repair capabilities will be available to meet the military needs of the nation should an emergency or contingency arise (i.e., surge situations). The concept of core capability helps guide government policy on which activities DOD should perform at a military depot and which activities the private sector could or should perform.

DOD's two-pronged approach in its implementation of the core statute includes (1) the biennial core determination process for capturing and reporting core capability requirements and associated planned workloads for fielded systems and (2) the acquisition process for identifying and establishing core capability for new systems and those undergoing modifications. The following summarizes these processes.

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### Core Determination Process for Fielded Systems

DOD's 2007 biennial core determination process began with a December 2005 tasking letter from the Deputy Under Secretary of Defense for Logistics and Materiel Readiness to the services. The letter included guidance on the process and required the services to provide proposed depot maintenance core capability requirements and sustaining workloads for fiscal year 2007. The 2005 guidance in the tasking letter generally mirrored subsequent guidance issued in January 2007.<sup>8</sup>

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<sup>7</sup> Further, the Deputy Under Secretary of Defense for Logistics and Materiel Readiness is responsible for the maintenance of the biennial core calculation and its computation methodology; the issuance of tasking memorandums to trigger the computation process on a biennial basis; the collection, review, and evaluation of services' submissions; and the computation of the composite core capability requirements and associated workloads for DOD.

<sup>8</sup> DOD Instruction 4151.20, *Depot Maintenance Core Capabilities Determination Process*, January 5, 2007. One significant change in the instruction, compared with the earlier tasking letter, is that it requires the services to include in their biennial reports plans to rectify core capability shortfalls, if any.

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The DOD core determination process is comprised of a series of mathematical computations and adjustments that are used to derive required core capability requirements and the associated planned workloads expected to be available to sustain those capabilities.<sup>9</sup> The computations involved in this methodology are performed from the perspective of the service that owns the depot maintenance assets and are divided into two parts. Part 1 identifies the core capability requirements for DOD weapon systems. The services identify applicable weapon systems based on the JCS contingency scenarios. The JCS scenarios represent plans for responding to conflicts that may occur in the future. All systems required to execute the JCS scenarios are to be included in the core determination process regardless of whether depot maintenance is actually performed in the public or private sectors. The services exclude some systems for several allowable reasons (i.e., special access programs) that are documented citing the authority for each exclusion from the core process.

After the applicable weapon systems are identified, the services compute annual peacetime depot maintenance capability requirements in direct labor hours to represent the amount of time it regularly takes to perform required maintenance, and a number of adjustments to these computations are then applied. Contingency requirements and resource adjustments are made to account for applicable surge factors during the different phases of a contingency (for example, preparation/readiness, sustainment, and reconstitution). The objective is to determine the most appropriate composite “surge” adjustment for a particular set of circumstances. Further adjustments are made to account for redundancy in depot capability. For example, a service may determine that repair capabilities for specific systems maintained in military depots are so similar that the capabilities for one system can effectively satisfy the capability requirements for another. Core capability requirements also are adjusted when one service’s maintenance capability requirements will be supported by other services. Throughout Part 1, core capability data for individual systems are incorporated into categories of equipment and technologies, which are also known as work breakdown structure categories, and these

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<sup>9</sup> For the purposes of the biennial core determination process, DOD defines “capability” as the combination of skilled personnel, facilities and equipment, processes, and technology needed to perform a particular category of work, and that are necessary to maintain and repair the weapon systems and other military equipment needed to fulfill strategic and contingency plans. DOD measures core capability requirements and the associated workload in direct labor hours.

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categories are to be broken down at a minimum, to the third level of indenture<sup>10</sup> for aircraft and components, the second level of indenture for aircraft engines, and the first level of indenture for all other categories. For example, the aircraft equipment category includes subcategories for airframes, aircraft components, and aircraft engines, while the airframes category is further divided by types of airframes and the aircraft component category is subdivided into instruments, landing gear, avionics/electronics, and other areas.

Part 2 of the biennial core process identifies the planned workloads associated with sustaining the depot maintenance core capability requirements identified in Part 1. In this part, after the amount of depot maintenance workloads (in direct labor hours) that are needed to sustain core capabilities are subtracted from funded public sector depot maintenance workload in each equipment/technology category, the difference could represent either an amount of workload that is not needed to sustain core capability requirements or a shortfall amount.<sup>11</sup> This part establishes a minimum level of public sector depot maintenance workloads within each service. Applicable information on the results of each step in this process for Parts 1 and 2 are recorded on the DOD depot maintenance core capability worksheets and provided to OSD, which compiles the service data into a departmentwide assessment that is summarized in an internal report.

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## Core Logistics Capability within DOD's Acquisition Process

DOD uses the acquisition process to identify and establish core capability requirements for new and modified systems. The department's overarching acquisition guidance, DOD Directive 5000.01,<sup>12</sup> states that the program manager shall be the single point of accountability for accomplishing program objectives for total life-cycle systems management, including sustainment. DOD Instruction 5000.02,<sup>13</sup> which provides additional DOD guidance for managing and overseeing defense

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<sup>10</sup> An indenture is a lower-level element of defense materiel or equipment.

<sup>11</sup> This calculation may include other factors. For example, DOD's biennial core determination guidance states that "substitutions of similar workloads may be made as necessary to fulfill core capability requirements for systems with limited inventories or fluctuating workload requirements."

<sup>12</sup> DOD Directive 5000.01, *The Defense Acquisition System*, November 20, 2007.

<sup>13</sup> DOD Instruction 5000.02, *Operation of the Defense Acquisition System*, December 2, 2008.

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acquisition programs, requires that program managers perform a core logistics analysis,<sup>14</sup> as part of the acquisition strategy, by the Milestone B acquisition decision point or by Milestone C, if there is no Milestone B. Milestone B is the second major decision point in the acquisition process and comes after the technology development phase. Milestone C, the third major decision point, comes after the system development and production phase. The core logistics analysis identifies whether the capability to maintain and repair a weapon system is necessary to support core requirements and whether the capability should be established at a military depot. Furthermore, according to DOD Directive 4151.18,<sup>15</sup> capabilities to support identified depot maintenance core requirements shall be established not later than 4 years after the system's initial operational capability.<sup>16</sup> The program manager uses DOD's acquisition management framework that is intended to translate mission needs and requirements into systems acquisition programs. The program manager develops an acquisition strategy that details how the program's goals and objectives will be met. The acquisition strategy also serves as a "road map" for program execution from program initiation through post-production support. As part of the acquisition strategy, the core analysis is supposed to identify whether a weapon system will satisfy core logistics requirements.

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## Prior GAO Work on Core Logistics Capabilities

In 2001, we reported that DOD lacked assurance that core logistics capabilities were being maintained as needed to ensure timely and effective response to national defense emergencies and contingencies, as required by Section 2464 of Title 10, noting that several factors precluded this assurance.<sup>17</sup> DOD's core policy, which established a process for identifying core maintenance capability, was not comprehensive in that it

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<sup>14</sup> In referring to this requirement, the guidance uses the term core logistics analysis/source of repair analysis.

<sup>15</sup> DOD Directive 4151.18, *Maintenance of Military Materiel* (Mar. 31, 2004). The directive indicates that all maintenance and repair of weapon systems necessary for strategic and contingency plans need not be performed in public facilities. Rather, the capability (in the form of skills, equipment, and facilities) to perform maintenance and repair of these systems must be retained in those facilities.

<sup>16</sup> Initial operational capability is the first attainment of the capability to effectively employ a weapon, item of equipment, or system of approved specific characteristics that is manned or operated by an adequately trained, equipped, and supported military unit or force.

<sup>17</sup> GAO, *Defense Logistics: Actions Needed to Overcome Capability Gaps in the Public Depot System*, [GAO-02-105](#) (Washington, D.C.: Oct. 12, 2001).

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did not provide a forward look at new weapon systems and associated future maintenance capability requirements. In addition, we also reported that DOD has had other limitations, including a lack of sufficient investment in facilities, equipment, and human capital to ensure the long-term viability of the military depots.

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## DOD Has Not Comprehensively and Accurately Assessed Whether It Has the Required Core Capability to Support Fielded Systems

DOD, through its core process, has not comprehensively and accurately assessed whether it has the required core capability to support fielded systems in military depots. Although DOD generally followed its own guidance for conducting the 2007 biennial core assessment, we found that (1) DOD's method of compiling and internally reporting core requirements and associated workloads for the 2007 core process did not reveal shortfalls that the services had identified for specific equipment/technology categories, (2) the services had errors and inconsistencies in their identification of core requirements and associated workloads, and (3) there was no mechanism for ensuring that the services take corrective actions to resolve capability shortfalls. As a result of these deficiencies, DOD lacks assurance that it has the required capabilities to support its core requirements. Finally, DOD is not required to provide Congress information on its core process, and therefore the results of the core process are not readily and routinely visible for purposes of congressional oversight.

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## DOD's Method of Compiling and Internally Reporting Core Requirements and Associated Workloads Did Not Reveal Specific Shortfalls

The method by which DOD compiled and internally reported its 2007 core requirements and associated workloads did not reveal core capability shortfalls, even though the services, in their core computations, had identified shortfalls in specific equipment/technology categories. For example, the Army and the Navy identified workload shortfalls to support avionics and electronics components—a shortfall of 238,090 labor hours in the Army and 78,974 hours in the Navy. However, DOD did not disclose this and other specific shortfalls because it aggregated the results of the core determination process in its internal reporting on core capability. As a result, DOD did not present a comprehensive and accurate assessment of the services' 2007 core capability. Core capability shortfalls exist when the military depots do not possess the combination of skilled personnel, facilities, equipment, processes, and technology that are needed to perform a particular category of work (e.g., composite repair) and that are necessary to maintain and repair the weapon systems and other military equipment needed to fulfill strategic and contingency plans. When shortfalls occur, DOD may not have the necessary capability to repair



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weapon systems, which could affect the readiness of troops that rely on these weapon systems that support future military operations.

According to an internal memorandum summarizing the results of the core process for the Under Secretary of Defense for Acquisition, Technology, and Logistics, DOD determined that projected workload in military depots was adequate to support core capability requirements.<sup>18</sup> The memorandum stated, “The Services are complying with their core capability requirements as they meet wartime needs. Their projected organic workloads in military depots are adequate to support core capability requirements.” More specifically, the memorandum stated that the department’s planned maintenance workload of 92.7 million hours was “well over” the minimum of 70.5 million hours needed to fulfill core requirements at military depots. The memorandum further reported that the Marine Corps, alone among the four services, had planned workload in military depots that was less than its core requirement due to funding constraints, although it added that depot capacity was available to meet the core requirement. According to the memorandum, using fiscal year 2007 funding requested for expenses associated with the Global War on Terrorism,<sup>19</sup> the Marine Corps should be able to meet its core requirement. The memorandum recommended that the Under Secretary approve the DOD identification of core logistics capabilities, and the approval was subsequently given. Table 1 shows the total core capability requirements and planned workloads, by service, as summarized in the internal DOD memorandum.

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<sup>18</sup> The memorandum, dated March 7, 2007, was prepared by the Office of the Deputy Under Secretary of Defense for Logistics and Materiel Readiness.

<sup>19</sup> Also known as supplemental funding.

**Table 1: Reported 2007 Core Requirements and Planned Workloads in Direct Labor Hours**

Military service	Core requirement	Planned workload in military depots
Army	15.5	19.2
Navy	33.6	48.5
Marines	1.5	1.3
Air Force	19.9	23.7
<b>Total</b>	<b>70.5</b>	<b>92.7</b>

Source: DOD.

To derive its assessment of core capability, DOD compiled and reported aggregated totals of the services' core requirements and associated workloads. DOD core determination guidance does not specify how to identify departmentwide core requirements and workload. However, DOD's method of computing aggregated totals had the effect of masking workload shortfalls that the services had identified in specific equipment/technology categories. The services, in their respective core computations, identified planned workload shortfalls in a total of 18 equipment/technology categories. The Army identified the greatest shortfall in core capability workload, identifying a total shortfall of 1.4 million direct labor hours across 10 equipment/technology categories. The Marine Corps had shortfalls in 7 categories and the Navy in 6. However, the combined Marine Corps and Navy shortfall was only about 35 percent of the Army's. Table 2 shows the 18 equipment/technology categories for which the services identified shortfalls in planned workload to meet core requirements.

**Table 2: Equipment/Technology Categories with Identified Shortfalls in Direct Labor Hours for 2007**

Equipment/technology category	Army	Navy	Marine Corps
<b>Aircraft</b>			
Dynamic components		(38,614)	
Instruments		(17,567)	
Landing gear		(25,029)	
Aviation ordnance		(58,544)	
Avionics/electronics	(238,090)	(78,974)	
<b>Ground vehicles</b>			
Tactical (wheeled) vehicles			(41,170)

<b>Equipment/technology category</b>	<b>Army</b>	<b>Navy</b>	<b>Marine Corps</b>
<b>Sea ships</b>			
Surface combatants/others		(69,978)	
<b>Communication/electronic equipment</b>			
Radar total			(11,752)
Radio total	(92,097)		(7,280)
Wire total	(125,760)		
Electro-optics/night vision	(280,040)		
Other total	(21,396)		(325)
<b>Support equipment</b>			
General support equipment	(429,271)		(5,597)
Generators	(120,375)		(5,269)
Test, measurement, and diagnostic equipment	(61,912)		
Other	(47,402)		
<b>Ordnance, weapons, and missiles</b>			
Conventional weapons			(133,143)
<b>Fleet/field support</b>			
Fleet/field support	(6,332)		
<b>Total</b>	<b>(1,422,675)</b>	<b>(288,706)</b>	<b>(204,536)</b>

Sources: GAO analysis of DOD data.

Note: The data shows total public-sector-funded workload hours minus core capability requirement hours. Numbers in parentheses indicate a shortfall.

As shown in table 2, one area of significant shortfall in 2007 was in workload for Navy aircraft components. For example, the Navy had shortfalls of 218,728 hours in workload for dynamic components, instruments, landing gear, aviation ordnance, and avionics/electronics. In a Naval Air Systems Command briefing discussing the results of the 2007 core results, several reasons were identified for some shortfalls. For example, according to the Command, the Navy had designated 10 percent of the items in the component database for repair in a military depot, but these items had been repaired by contractors because a depot repair capability was not established. Additionally, in some cases where a military depot had established repair capability, sustaining workloads were still going to the private sector, according to Naval Air Systems Command officials.

When we initially met with OSD officials responsible for developing DOD's 2007 core assessment, the officials told us they were aware only of the Marine Corps' shortfalls, but not the Army's and Navy's. However, when

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we brought the results of our analysis to their attention, they acknowledged that these two services had also identified shortfalls. The officials noted, however, that under OSD's methodology for aggregating the services' core data, shortfalls in specific equipment/technology categories could be offset if one service had sufficient depot repair capability to support the core requirements for another service. For example, the Marine Corps had a shortfall in capability to repair tactical wheeled vehicles while the Army had more workload in this equipment/technology category than it needed to support its core requirements. However, since OSD officials, at the time they made this assessment, were unaware that some services had shortfalls, it is unknown to what extent OSD could have made this offset determination.

We applied OSD methodology for offsetting shortfalls in the same equipment/technology categories across services to identify the potential workload shortages that could be offset under these circumstances. The result of applying this methodology was that DOD's 2007 core shortfall could be reduced by approximately 600,000 hours. However, this still leaves a net shortfall of more than 1.3 million hours. Furthermore, it is unclear that workload could be transferred cross-service as this analysis might indicate. On the basis of our discussions with DOD officials, we found that while the skill sets for repairing equipment may be the same or similar, particularly for repairing less complex equipment such as tactical wheeled vehicles, the ability to offset shortages in one service with excess capacity in another would depend on the two services having the same systems or systems so similar that repair capability in one service could support the other service's equipment. Skilled labor capable of working on equipment from a given equipment/technology category may be able to repair similar equipment from another service if the workers have the required technical data, depot plant equipment is available, and the workers have received necessary training. However, technical data and, to some extent, depot plant equipment, are generally specific to a weapon system. Thus, without knowing the extent to which the excess workload from one service would represent maintenance that could be performed by another service with a shortfall of work, cross-service analyses of workload within the same equipment/technology category would not be meaningful.

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## DOD's Core Process Resulted in Errors and Inconsistencies in the Services' Identification of Core Requirements and Associated Workloads

During our review, we found some errors and inconsistencies in the services' implementation of the biennial core determination process. Moreover, DOD did not have effective internal controls to prevent these errors and deficiencies in the core process.

First, most of the services did not accurately identify weapon systems required to support the 2007 core requirements. According to DOD's core guidance, the starting point for calculating core requirements is to identify weapon systems and equipment that are included in the JCS contingency scenarios. The guidance states that when beginning to compute core requirements, the services should consider all scenario-tasked weapon systems that require depot maintenance, regardless of whether maintenance for particular systems is currently being accomplished in the public or private sector. The Marine Corps excluded some JCS-tasked systems, such as the Medium Tactical Vehicle Replacement system, from its core computation. Although systems repaired both in the public and private sectors should have been included in its core computation, Marine Corps officials stated that they did not include systems unless they had been previously repaired in military depots. Thus, they erroneously excluded some JCS systems from the starting point for calculating core requirements. The Marine Corps official who performed the analysis said he asked for guidance from Marine Corps Headquarters on what systems should be included, but did not get a list of systems. In addition, according to a May 2007 Army Audit Agency report,<sup>20</sup> Army officials were unable to verify that all JCS-tasked systems were included in the service's core reviews. Army officials said that they relied heavily on the program executive office to conduct accurate and thorough reviews, but could not prove that all weapon systems were assessed during the review. Because the Army could not show whether all systems were included in the biennial core process, the Army lacks the assurance that core capabilities were identified for all required weapon systems.

Second, we found that the Navy and the Marine Corps omitted software maintenance workloads from their 2007 biennial core requirements computations, while the Army and the Air Force included software maintenance in their core computations. The Naval Air Systems Command's rationale for not including software maintenance in its calculation was that the Navy does not consider software maintenance as

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<sup>20</sup> U.S. Army Audit Agency, *Follow-up Audit on Process for Determining Source of Depot Level Maintenance*, A-2007-0130-ALM (May 22, 2007).

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maintenance in the usual sense of returning an item back to its original condition.<sup>21</sup> Also, the Navy does not perform software maintenance in facilities that are traditionally considered depots. Nonetheless, cognizant OSD officials told us that because DOD's biennial core guidance defines depot maintenance to include all aspects of software maintenance,<sup>22</sup> the Navy and Marine Corps should be including software maintenance in their core analysis inputs. Given the services' differing methodologies in computing their respective core requirements, DOD cannot logically compute the composite core capability requirements for the department as a whole, as required by its guidance. Most importantly, DOD increasingly relies on software to introduce or enhance performance of weapon systems, and making software adjustments is increasingly a key component of maintaining systems to prepare for emergency conditions. Thus, it is important to comprehensively identify the software core maintenance requirements.

Third, the Air Force, as a part of its adjustment for redundant or duplicate capability, reduced its requirements because of private sector maintenance workload. Duplicate or redundant capabilities occur when multiple systems are similar and share a common or complementary base of repair processes, technologies, and capabilities, or when a large quantity of single platform requirements necessitate duplicate capabilities. DOD core guidance requires that as a part of the core assessment, the services adjust for duplicate maintenance work. According to DOD officials, the intent of this provision in the guidance was that redundant capability should only consider DOD depot workload—not private sector workload. However, the Air Force considered private sector workload in making these adjustments. For example, for most airframes, engines, and

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<sup>21</sup> Naval Air Systems Command explained that when a problem caused by a component failure is found in hardware, the solution entails bringing the hardware item back to its original configuration — whereas in the case of software, when a problem is found and corrected, a new configuration is created. Given that, command officials felt that the classic organic depot scenario of an artisan using tools to restore an item to its original condition would never apply in the software world, and a more appropriate term than software maintenance would be software support. Further, the officials felt that the work reserved for organic depots under the core statute is a subset of a much larger world defined by Section 2460, and “software maintenance” is depot maintenance in this broader sense, rather than in terms of the core statute.

<sup>22</sup> DOD guidance, both in the 2005 tasking letter and the subsequent DOD Instruction 4151.20, further states that software is defined as “[a] set of computer programs, procedures, and associated documentation concerned with the operation of a data-processing system (e.g., compilers, library routines, manuals, and circuit diagrams).”

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other major end items, the Air Force reduced its workload based on private sector workload.

According to Air Force officials, they included private sector workload in the redundancy adjustment because they believed they had flexibility to include both public and private sector workloads. Cognizant OSD officials said they were unaware of the Air Force approach of including private sector workload. When we informed them of the Air Force's practice, they agreed that this adjustment was not appropriate. They noted that since the purpose of the core capability requirements determination process is to identify public sector depot maintenance capability, reducing the depot maintenance direct labor hours because of workload that exists in the private sector is not what was intended by DOD core guidance.

By including private sector capability in its redundancy adjustment, the Air Force is misstating its workload and limiting its flexibility to support critical systems using military depot capability. The Air Force was the only service that did not identify shortfalls using the same methodology as the other services. However, if they had not used private sector capability to adjust for redundancy, it is likely that some categories would have had shortfalls. For example, at least 10 equipment categories had core requirements equal to the planned core workloads assigned. Thus, adding back in the private sector adjustment that the Air Force made would mathematically result in a shortfall.

Fourth, as noted above, the Air Force used a methodology for calculating core capability shortfalls that differed from the methodology used by the other services. Although DOD core guidance provides instructions for determining core requirements and associated workload, it does not specify how to calculate shortfalls based on the worksheets developed by each service. In our discussions with service and OSD officials, they agreed that the correct method is to subtract core requirements from planned workload. If the difference is a negative number, that would indicate a core shortfall. The Army, Navy, and Marine Corps all used this method in calculating the results of the core determination process, and we also applied this method in calculating shortfalls in specific equipment/technology categories. However, the Air Force used a different method of calculating shortfalls, which showed shortfalls in specific equipment/technology categories that did not materialize using the other services' methodology. For example, unlike the other services, the Air Force adjusted its core requirements before computing shortfalls. According to Air Force officials, this method has been a long-standing practice within the Air Force. To compound this inconsistency between

the Air Force and the other services, OSD's internal memorandum, which summarized core results across the department, reported adjusted core requirements for the Air Force of 19.9 million direct labor hours, based on the Air Force's methodology. If OSD had reported the Air Force's total core requirements using the same methodology as the other services, the Air Force's total core requirement would have been 18.7 million direct hours. Table 3 shows shortfalls the Air Force identified for 2007 using its methodology.

**Table 3: Shortfalls in Core Capability Identified by the Air Force in Direct Labor Hours for 2007**

<b>Equipment/technology category</b>	<b>Shortfall</b>
<b>Airframes</b>	
Composite	34,000
<b>Tanker/transport</b>	<b>100,000</b>
<b>Subtotal</b>	<b>134,000</b>
<b>Software</b>	
Operational flight program	170,000
<b>Subtotal</b>	<b>170,000</b>
<b>Components</b>	
Hydraulic components	150,000
Airborne electronics	650,000
Instruments	600,000
<b>Subtotal</b>	<b>1,400,000</b>
<b>Total</b>	<b>1,704,000</b>

Source: U.S. Air Force Headquarters.

As shown in table 3, the analysis identified core capability shortfalls for airframes, software, and components, with the component shortfall representing 82 percent of the total. The Air Force, in presenting these shortfalls, also considered depot maintenance workload for new and emerging systems that could mitigate shortfalls. For instance, the Air Force cited requirements for the F-22A, Joint Strike Fighter, and CV-22 aircraft and the Predator and Global Hawk unmanned systems.



## DOD's Core Process Lacks a Mechanism for Ensuring That the Services Take Action to Resolve Core Capability Shortfalls for Fielded Systems

DOD's core process lacks a mechanism for ensuring that corrective actions are taken to resolve core capability shortfalls for fielded systems. At the time the services prepared their 2007 biennial core calculations, the services were not required to and therefore did not develop plans to specifically address capability shortfalls at the equipment/technology category level for fielded systems. Further, some Army officials told us that the core process is an exercise in futility in that the services are required to conduct the core analysis, but nothing comes out of it to address shortfalls. Thus, the services compute their biennial requirements, workload, and shortfalls, as required by DOD's core guidance, but the results are put on the shelf and little is done until the next biennial process. As shown in table 4, our analysis of the Army's biennial core data found that shortfalls for some equipment/technology categories substantially increased from 2005 to 2007, while shortfalls in other categories were eliminated.

**Table 4: The Army's Core Capability Shortfalls in Direct Labor Hours Identified in 2005 and 2007**

Equipment/technology category	FY 05	FY 07
Avionics/electronics	0	238,090
Aircraft components	20,422	0
Combat vehicles	104,805	0
Tactical wheeled vehicles	47,591	0
Communications/electronics	357,195	519,293
Support equipment	345,861	658,960
Tactical missiles	9,935	0
Fabrication/manufacturing	70,926	0
Fleet/field support	914	6,332
Other	18,258	0
<b>Total</b>	<b>975,907</b>	<b>1,422,675</b>

Sources: GAO analysis of DOD data.

Note: Shaded rows show categories where shortfalls increased between 2005 and 2007.

Unlike the core guidance that was in effect for the 2007 core process, the guidance for the ongoing 2009 core process requires the services to include in their biennial reports plans to rectify capability shortfalls (if any), including a description of planned capital investment, timing, and planned workarounds until new capability is available. Although the new guidance is a step in the right direction, it falls short of establishing an effective mechanism to ensure that shortfalls are corrected. Further, the

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new guidance does not require that mitigation plans address shortfalls at the equipment/technology category level. Finally, since the core computations occur every 2 years, DOD would not know whether progress was being made in the interim period.

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## Congress Lacks Visibility of DOD's Core Process

Because there is no requirement to do so, DOD does not provide Congress information on the results of the biennial core determination process for fielded systems. Thus, Congress does not have readily available and routine visibility of core capability requirements, associated workloads, and shortfalls, if any exist. As a result, Congress is not in the best position to make oversight decisions, and DOD is not held accountable regarding the extent to which the military possesses the core logistics capabilities specified in Section 2464 of Title 10, U.S. Code.

Conversely, DOD is required to report annually to Congress the percentage of depot-level maintenance and repair dollars spent in the public and private sectors—also known as the 50/50 reporting requirement. Under Section 2466(a) of Title 10, not more than 50 percent of funds made available in a fiscal year to a military department or defense agency for depot-level maintenance and repair may be used to contract for the performance by nonfederal government personnel of such workload for the military departments and agencies. Further, the Secretary of Defense must submit an annual report to Congress showing the percentages of funds expended for public and private depot maintenance.<sup>23</sup> Although we and some service audit agencies have cited shortcomings, service officials told us that the 50/50 reporting process has influenced the services to consider shifting maintenance work to military depots to improve their 50/50 posture. For example, because of the visibility associated with a breach in the 50/50 reporting requirement, DOD has required the services to prepare a get-well plan when they come within 2 percent of the 50 percent private sector depot maintenance funding ceiling. As a result, we previously reported that the visibility of the 50/50 reporting requirement helps to ensure that the percentage maximum is not

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<sup>23</sup> Specifically, under the statute, the Secretary of Defense must submit to Congress an annual report identifying, for each of the armed forces and defense agencies, the percentage of the funds that were expended during the preceding fiscal year, and are projected to be expended during the current fiscal year and the ensuing fiscal year, for performance of depot-level maintenance and repair workloads by the public and private sectors.

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exceeded. In contrast, there are no external reporting requirements associated with Section 2464 of Title 10.

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## **DOD Has Neither Identified nor Established Core Capabilities in a Timely Manner to Prepare Military Depots to Support Future Core Requirements for Some New and Modified Systems**

DOD has neither identified nor established core capabilities in a timely manner to prepare military depots to support future core requirements for some new and modified systems included in our review. As older systems phase out of the inventory and new or modified systems phase in, it is essential that the acquisition process ensures that program offices take the actions necessary to establish core depot maintenance capability in military depots. Two key actions that must occur are, first, the identification of any core depot maintenance capability requirements associated with the new system and, second, if there are no existing organic capabilities, the establishment of depot maintenance capabilities through the acquisition of all resources necessary to achieve those capabilities. Our review of the acquisition process demonstrated that program offices are not taking these actions in a timely manner. We identified shortcomings in the acquisition process that contributed to the lack of timely identification and establishment of core capabilities.

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## **DOD Did Not Identify Core Capabilities in a Timely Manner for Some New and Modified Systems in the Acquisition Process**

DOD did not identify core capabilities for some new and modified systems in the acquisition process in a timely manner. Although DOD acquisition guidance requires that core logistics capabilities be identified no later than Milestone B, or by Milestone C if there is no Milestone B, the identification of core requirements did not normally occur until later for most of the systems we reviewed. Specifically, for 20 of the 52 systems we reviewed, core capability was not identified until either the production and deployment or operations and support phases of the acquisition process (after Milestone C), which could be years after the identification was supposed to occur. For example, a core analysis for the Army's Stryker Family of Vehicles and the Air Force's Mobile Approach Control System were not completed until after Milestone C, by which time the systems were already in the production and deployment or sustainment phases. Our analysis also identified additional systems that should have had a core analysis completed by Milestone B, but for which analyses were not completed until Milestone C. Figure 1 shows the number of systems from our non-probability sample of 52 systems for which a core logistics analysis was prepared in each phase of the acquisition process.

**Figure 1: Number of Systems Identified Where Program Offices Prepared Core Logistics Analysis in Each Phase of the Acquisition Process**

	A	B	C		
	Concept refinement phase	Technology development phase	System development and demonstration phase	Production and deployment phase	Operations and support phase
Number of weapons systems where a core logistics analysis was prepared	<b>1</b>	<b>3</b>	<b>28</b>	<b>15</b>	<b>5</b>

Sources: GAO survey of DOD program offices.

Notes: Decision milestones A, B, and C are reached at the end of their respective acquisition phases. In December 2008, the concept refinement phase was renamed the materiel solution analysis phase, and the system development and demonstration phase was renamed the engineering and manufacturing development phase.

The U.S. Army Audit Agency’s 2007 report identified similar delays in the identification of core capability for some Army weapon systems that had achieved initial operational capability but had not been subjected to the core capabilities analyses required by Army and DOD guidance.<sup>24</sup> These systems included the Secure Mobile Anti-Jam Reliable Tactical Terminal (December 1999 initial operational capability), the Advanced Field Artillery Tactical Data System (fiscal year 1996 initial operational capability), and the Bradley Fighting Vehicle System A3 Upgrades (fiscal year 2001 initial operational capability). The Army Audit Agency report also stated that Army officials who did not perform the required analyses may not be assured that they made the best decisions for the Army regarding the use of organic or contractor support.

According to DOD officials and based on the results of our analyses, if core capability requirements for new and modified systems have not been identified early in the acquisition process, and if there is no existing DOD

<sup>24</sup> A-2007-0130-ALM.

capability for a particular system, it is unlikely that core capability can be established at military depots within 4 years of initial operational capability, as required by DOD guidance. Also, delays in making maintenance decisions can significantly limit DOD’s sustainment concept options because as programs progress in the acquisition timeline, program decisions already made—such as not making provisions for the acquisition of technical data (or access to it), depot plant equipment, and other resources required to establish military depot maintenance capability—may limit the practicability of being able to establish core capability in a military depot.

**DOD Is Not Establishing Required Core Capabilities for Some New and Modified Systems in a Timely Manner**

In addition to not identifying core capability requirements in a timely manner for new and modified systems in the acquisition process, program offices are also not taking the actions that are needed to establish required core capabilities in a timely manner. Although DOD Directive 4151.18 states that the capabilities to support identified depot maintenance core requirements shall be established not later than 4 years after initial operational capability for DOD materiel directly supporting the department’s strategic and contingency plans, this is not always occurring. Specifically, 24 of the 30 programs we reviewed with identified core requirements either had not established any core capability or had achieved only a partial core capability within 4 years of their initial operational capability.<sup>25</sup> Table 5 summarizes our analysis of the 30 systems in our review.

**Table 5: Extent to Which Systems in Our Review with Identified Core Requirements Have Maintenance and Repair Capabilities Established In Military Depots**

Status of establishment of core capability	Number of systems
Core capability not established	11
Partial capability established through performance-based logistics arrangements or public-private partnerships	13
Required capability established	6
<b>Total systems in our review</b>	<b>30</b>

Sources: GAO analysis of DOD data.

<sup>25</sup> We initially analyzed data for 73 weapon systems that were new or undergoing a modification, but excluded 43 systems for various reasons. Our reasons for excluding the 43 systems are provided in table 6 of appendix 1.

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Some Programs Had Not Established Any Core Capability within Required Time Frames

According to program officials, 6 of the 30 systems we reviewed were fielded and had required core capability established in military depots. For 11 of the 30 programs we reviewed, however, DOD had not established any of the required core capability to maintain and repair the systems. Another 13 of the programs had established some but not all core capability through either performance-based logistics arrangements (11 programs) or public-private partnerships (2 programs) with contractors. According to DOD officials, these arrangements and partnerships with contractors were intended to support the core workload.

The following discussion illustrates cases among the 11 programs in our review where the required core capabilities were identified, but had not been established in the military depot system within 4 years of initial operational capability as required by DOD guidance.

- The Navy's Air Launched Expendable-50 (ALE-50) System, which provides an electronic countermeasure method against anti-aircraft missile threats, reached initial operational capability in 2002. However, no core capability to maintain and repair this system exists in a military depot, even though it should have been established by 2006. The Navy determined that the ALE-50 had core requirements, and the Navy and the Joint Depot Maintenance Activities Group<sup>26</sup> agreed that organic capability should be established at Naval Aviation Depot, Jacksonville, Florida—now known as Fleet Readiness Center Southeast, Jacksonville.<sup>27</sup> Interim commercial support was established until the organic capability could be established. Currently, the Jacksonville depot has only the capability to troubleshoot and to make limited repairs to certain components. However, the contractor performs most depot maintenance on this system. According to Navy and program officials, while the Naval Air Systems Command has requested funds to establish core capability, funds from the Office of the Chief of Naval Operations have not been made available to stand-up the required depot capability. Thus, 7 years after the system reached initial operational capability, the depot still does not have full capability to repair the ALE-50.

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<sup>26</sup> The Joint Depot Maintenance Activities Group, among other functions, conducts depot maintenance interservice studies and recommends sources of repair for new weapon systems and equipment.

<sup>27</sup> As a result of the 2005 Defense Base Closure and Realignment Commission Report, the Navy changed the names of the naval aviation depots to fleet readiness centers.

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- The Navy's Mission Computer Upgrade, which reached initial operational capability in 2002, is the primary computing device on the E-2C aircraft. The electrical cabinet component of this unit which was designated as core is used to house the computer's circuit cards. This unit provides digital data signal interface and power to the circuit card assemblies and routes all external sensor and operator control inputs to the applicable circuit card assemblies. Eleven depot-level repairable items on the computer have core requirements and, therefore, a capability to maintain and repair these items should exist in military depots. Currently, no DOD depot has the capability to maintain and repair the mission computer cabinet. Although the program office has identified and requested the funding that would be required to purchase technical data and depot plant equipment needed to establish this capability, the funding from the Office of the Chief of Naval Operations has never been made available. Thus, the candidate repair depot—Fleet Readiness Center Southwest, North Island—did not have repair capability 7 years after initial operational capability, and the original equipment manufacturer is still repairing the equipment.
  - The Navy's Advanced Tactical Air Reconnaissance System (ATARS), which reached initial operational capability in 2000, is a reconnaissance avionics subsystem consisting of a sensor suite providing image acquisition, data storage, image manipulation, and reconnaissance system control functions. Reconnaissance system control functions include the capability to record radar sensor data and control a data-link subsystem for real-time and near-real-time transmission. Although ATARS was determined to have core requirements, program officials indicated that the manufacturer was determined to be the only cost-effective source of repair due to the limited number of systems and the unique tools needed for the complex repairs. Thus, funding to establish core capabilities for ATARS has been requested by the program officials; however, funds from the Office of the Chief of Naval Operations have not been made available 9 years after initial operational capability. While ATARS was fielded before DOD issued its guidance requiring core capability to be established within 4 years of initial operational capability, the guidance does not exempt systems that were already fielded or those where establishing capability is costly.

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Some Programs Managed under a Performance-Based Logistics Arrangement or Public-Private Partnership Did Not Have All Core Capability Established within Required Time Frames

The following discussion illustrates cases among the 13 programs we reviewed where a partial, but not full, core capability had been established in the military depot system through the implementation of performance-based logistics arrangements or public-private partnerships. Performance-based logistics involve the purchase of performance outcomes (such as the availability of functioning weapon systems) through long-term contractor support arrangements rather than the purchase of individual elements of support, such as parts, repairs, and engineering support.<sup>28</sup> Public-private partnerships for depot-level maintenance are cooperative arrangements between a depot-level maintenance activity and one or more private sector entities to perform DOD or defense-related work, to utilize DOD depot facilities and equipment, or both.<sup>29</sup>

- The Air Force's Large Infrared Countermeasure (LAIRCM) System, which reached initial operational capability in 2004, provides fast and accurate threat detection, processing, tracking, and countermeasures to defeat current and future generation infrared missile threats. The LAIRCM has been maintained by the manufacturer because the Air Force did not acquire the technical data or depot plant equipment needed to support establishing a core capability at the depot. According to program officials, these resources were not a high enough program priority to be funded. The Air Force and Joint Depot Maintenance Activities Group agreed that organic capability should be established at the Warner Robins Air Logistics Center through a public-private partnership, but currently, there is no work being performed at the depot. According to program officials, the depot will receive some workload in 2009 and is expected to be fully capable of maintaining the system in 2010, but it is unclear whether this milestone will be achieved.
- The Army's AN/MPQ-64 Sentinel Radar System achieved initial operational capability in 1997. While the Sentinel's core depot assessment, completed in May 2004, determined the system to have core requirements, currently core capability has been established for only 11 of the 29 depot-level reparables, and these are the components that are common to the Firefinder radar system, the precursor to the Sentinel. By the third quarter of fiscal year 2009, core capability will be established to repair two

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<sup>28</sup> For further information on performance-based logistics, see GAO, *Defense Logistics: Improved Analysis and Cost Data Needed to Evaluate the Cost-effectiveness of Performance Based Logistics*, [GAO-09-41](#) (Washington, D.C.: Dec. 19, 2008).

<sup>29</sup> For further information on partnerships, see GAO, *Depot Maintenance: DOD's Report to Congress on Its Public-Private Partnerships at Its Centers of Industrial and Technical Excellence (CITEs) Is Not Complete and Additional Information Would Be Useful*, [GAO-08-902R](#) (Washington, D.C.: July 1, 2008).



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additional depot-level reparable items, thus increasing the reparable capability to 13 depot-level items. The Sentinel is supported with a performance-based logistics arrangement with Thales Raytheon Corporation, which was supposed to partner with the Tobyhanna Army Depot to provide the capability to achieve core capability. Additionally, the Tobyhanna Army Depot does not have full capability to test either the original Sentinel system or the improved version, for which 62 of the Army's 143 systems have been upgraded. According to Army officials, funding is not available to establish full core capability. Thus, 12 years after initial operational capability was achieved, the Army still had not established the required capability in the military depot system.

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### Shortcomings in the Acquisition Process Contributed to Lack of Timely Identification and Establishment of Core Capability

We identified several shortcomings in the acquisition process that contributed to the lack of timely identification and establishment of core capability for new and modified systems. More specifically, (1) acquisition guidance provides little to no information on how to identify and plan for the establishment of core capability, (2) acquisition strategies do not fully address core requirements, and (3) some program offices are not procuring technical data required to establish core capabilities.

### Acquisition Guidance Does Not Explain How the Core Analysis Should Be Performed or Provide Information on Actions Needed to Establish Core Capability

While DOD requires the identification and establishment of core capability for new and modified systems, we found that DOD acquisition guidance does not explain how the required core analysis should be performed, or provide specific information on actions needed to establish core capability. As discussed earlier, DOD Instruction 5000.02 requires that a core logistics analysis be included as part of the acquisition strategy by Milestone B or by Milestone C, if there is no Milestone B. However, this guidance resides in a table of statutory and regulatory information requirements, which deemphasizes this requirement compared to guidance provided in the main text of the instruction. Further, the instruction provides no specifics about the elements—such as resource requirements and time frames—needed to effectively plan for the establishment of a core capability if a core requirement is identified through the core logistics analysis. In December 2008, DOD updated Instruction 5000.02 and made a change that requires that the core logistics analysis and source of repair analysis be addressed in the life-cycle sustainment plan for Milestone B and that the life-cycle sustainment plan be included in the acquisition strategy document. However, while this guidance provides more emphasis on the sustainment phase, it still does not require specific plans, including resource requirements and time frames, for establishing core capability.

Other DOD acquisition guidance also lacks specific information on the elements necessary to effectively identify and establish core capabilities

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within the required time frames. The Defense Acquisition Guidebook, which was last updated in December 2004,<sup>30</sup> is a resource for program managers to use as a reference guide supporting their management responsibilities. The guidebook does not establish mandatory requirements, but provides the program managers with discretionary best practices. Regarding core logistics analysis, the Defense Acquisition Guidebook states only that the program managers shall ensure that maintenance source of support selection complies with requirements identified in DOD Instruction 5000.2. It provides no further specific direction for identifying and establishing core capability.

Moreover, DOD guidance overall places less emphasis on core capability relative to other guidance about sourcing sustainment activities, including maintenance, through performance-based logistics arrangements. DOD has identified performance-based logistics as the “preferred” support approach for DOD systems.<sup>31</sup> This emphasis on performance-based logistics contributes to the lack of emphasis by program offices on integrating core capabilities into the acquisition process. Some program officials cited what they perceive as a conflict between the department’s emphasis on outsourcing logistics activities through private contractors and the guidance to establish core logistics capability in military depots. One official provided us with a copy of a 1997 training guide for acquisition officials that emphasized an outsourcing strategy for supporting weapon systems.<sup>32</sup> The guide stated that under DOD’s outsourcing strategy, support concepts for new and modified systems maximize the use of contractor-provided, long-term, total life-cycle logistics support that combines depot-level maintenance with wholesale and selected retail materiel management functions. While this training guide is no longer in use, it illustrates the emphasis that has been placed on using sustainment approaches other than military depots.

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<sup>30</sup> According to OSD officials, the guidebook is currently being revised.

<sup>31</sup> In 2001, DOD identified performance-based logistics as the preferred weapon system support strategy, as stated in DOD, *Product Support for the 21st Century: A Program Manager’s Guide to Buying Performance (2001)*. In 2007, DOD further strengthened this emphasis on performance-based logistics by stating in a DOD policy directive that acquisition managers shall use performance-based strategies for sustaining products and services whenever feasible. See DOD Directive 5000.01, paras E1.1.16 and E1.1.17.

<sup>32</sup> Defense Systems Management College, *Acquisition Logistics Guide* (December 1997). The *Acquisition Logistics Guide* was prepared by the Defense Systems Management College as a teaching tool to reflect and institute DOD’s acquisition policies and procedures.

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Recognizing more guidance was needed on how to perform a core logistics analysis, the Army's Communications Electronics Life Cycle Management Command joined with the Program Executive Offices for Command, Control, Communications-Tactical and Intelligence, Electronic Warfare and Sensors in 2002 to develop standard operating procedures that document the steps needed to successfully complete this analysis, along with a corresponding source of repair analysis.<sup>33</sup> The standard operating procedures address elements that should be part of the core logistics analysis, both at the system and component level. For example, the procedures address the need for a program manager to ensure that the component-level core logistics analysis incorporates a plan for obtaining the rights or access to technical data. Because of a backlog of legacy systems for which a core analysis had not been performed, these Army offices also created a streamlined standard operating procedure applicable to legacy systems.<sup>34</sup>

Another shortcoming in DOD's acquisition guidance is that it does not make specific reference to the 4-year time frame for establishing core capability after a system reaches its initial operational capability. While this 4-year time frame is established within a DOD directive (4151.18) that is applicable across the department, this directive is generally used more by DOD's logistics support community than by the acquisition community. DOD Instruction 5000.02 is silent on the required time frame for establishing core capability.

Recognizing the importance of early identification of core requirements to the establishment of core capability, the Air Force since 2006 has required program offices to conduct an initial core assessment when the core analysis that is required by DOD guidance cannot be accomplished. The intent of this requirement is to allow for an earlier evaluation of the system's sustainment concept. According to the Air Force, traditionally source of repair and core decisions have not been accomplished until later in the acquisition process—at least partially due to not having sufficient data available about the system to accomplish a source of repair and core analysis. These delays led to decisions that ultimately limited the government's sustainment concept options. To address this concern, the

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<sup>33</sup> The standard operating procedure was updated in January 2007.

<sup>34</sup> For the purposes of the standard operating procedure, the term legacy system describes a system that has been fielded for at least 4-years since its initial operational capability date (or the date of the first fielding event).

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Air Force in December 2006 added an additional requirement to its acquisition guidance that a strategic source of repair determination be conducted for systems when a depot source of repair determination cannot be accomplished for program initiation approval (for example, by Milestone B) in order to allow for an earlier assessment of the sustainment concept.<sup>35</sup> Air Force officials told us that, under this new policy, the strategic source of repair determination should be conducted for new systems prior to Milestone B. Air Force officials pointed out that programs must still conduct a core logistics analysis as required under DOD Instruction 5000.02. The officials noted that from October 2007 to July 2008, the strategic source of repair determination was used on three weapon system acquisition programs: the F-15E Active Electronically Scanned Array Radar System, the KC-135 Replacement Tanker Aircraft, and the C-27 Joint Cargo Aircraft. The strategic source of repair determination for these three systems resulted in their being identified as having core capability requirements. According to the Air Force, the strategic source of repair determination will allow acquisition programs to identify anticipated sources of repair early enough in the acquisition process so that defense acquisition planning and programming documents, as well as resulting contracts, contain the appropriate sustainment elements needed to support the acquisition strategy. This initial core assessment appears to be a promising practice to support the timely establishment of core capability.

Acquisition Strategies Do Not Fully Address Core Requirements

Our review of acquisition strategies for 11 major acquisition programs prepared from April 2001 to February 2008 determined that this key acquisition documentation did not fully address core capability requirements for the systems or how the programs would go about establishing required core capabilities. The acquisition strategy is a business and technical management approach designed to achieve program objectives within the resource constraints imposed. It is the framework for planning, directing, contracting for, and managing a program. However, as noted earlier, DOD acquisition guidance does not explain how to incorporate specific plans for establishing core capability

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<sup>35</sup> Secretary of the Air Force, Memorandum, Strategic Source of Repair Determination (Dec. 20, 2006). While the December 2006 Policy Memorandum has expired, an Air Force official told us that the policy memorandum has been incorporated into draft Air Force guidance, and that the policy is still being followed.

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in the acquisition strategy. We looked at 11 ACAT I<sup>36</sup> system acquisition strategies to determine the extent to which these strategies addressed core capability requirements in the absence of specific DOD guidance. For example, in the absence of such guidance, we determined whether the strategies (1) stated that the systems were designated to support core capability requirements, (2) identified a possible depot source of repair, and (3) provided a plan for funding and establishing core capability. The acquisition strategies we reviewed did not include these types of information, even though the systems had been determined to have core requirements. Specifically, we found that the most frequent information provided in the acquisition strategies was simply a statement of the need to address core requirements as required by Section 2464 of Title 10. Further, none of the acquisition strategies we reviewed laid out a plan to establish core capabilities within 4 years of initial operational capability at military depots. Without adequate considerations for core capability requirements in pertinent decision documents, such as the acquisition strategies, program offices likely will not adequately plan for acquiring resources to establish core capability at military depots.

**Program Offices Did Not Procure Technical Data Needed to Establish Core Capability**

A key impediment to the establishment of core capability is that some program offices have not been procuring necessary technical data during the system acquisition process. Some of the programs in our review of new and modified systems for which a core capability was not established within required time frames cited the unavailability of technical data as a key factor contributing to this situation. Also, as discussed earlier, acquisition approaches that planned on long-term use of contractor support resulted in not acquiring technical data or access to technical data rights, which are essential for establishing depot maintenance capability in military depots.

In 2006, we reported that the lack of technical data rights limited the services' flexibility to make changes to sustainment plans that are aimed at achieving cost savings and meeting legislative requirements for depot

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<sup>36</sup> The acquisition category determines the level of review, decision authority, and applicable procedures for an acquisition program. Acquisition category I programs have an estimated total expenditure of more than \$365 million for research, development, test, and evaluation or procurement of more than \$2.19 billion. Acquisition category II programs have an estimated total expenditure for research, development, test, and evaluation between \$140 million and \$365 million or procurement between \$660 million and \$2.19 billion.

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maintenance capabilities.<sup>37</sup> Specifically, we reported on seven Army and Air Force weapon system programs where the services encountered limitations in implementing revisions to sustainment plans. The programs were the C-17 aircraft, F-22 aircraft, C-130J aircraft, Up-armored High-Mobility Multipurpose Wheeled Vehicle, Stryker family of vehicles, Airborne Warning and Control System aircraft, and M4 carbine rifle. Although circumstances surrounding each case were unique, earlier decisions made on technical data rights during system acquisition were cited as a primary reason for the limitations subsequently encountered. We noted that delaying action in acquiring technical data rights can make these data cost prohibitive or difficult to obtain later in the weapon system life cycle. For example, the Air Force did not acquire technical data during the acquisition process for the C-17, F-22, and C-130J aircraft. In these cases, the Air Force made attempts to obtain needed technical data but found that the equipment manufacturer, among others, declined to provide the data or it was too expensive. Without successfully working out arrangements to provide the depots the technical data they need, the Air Force cannot develop comprehensive core maintenance capability for these aircraft. Officials at the Warner Robins Air Logistics Center told us that while establishing partnerships is sometimes seen as the way to get around technical data issues, the depot has been challenged to establish viable agreements with the subcontractors for various C-17 systems and components that were identified as core requirements. Similarly, the Army Materiel Command designated Anniston Army Depot as the Army's depot maintenance facility using a performance-based logistics arrangement with General Dynamics Land Systems for the Stryker family of vehicles. According to Army officials, the contract with General Dynamics Land Systems will provide Anniston with instructions for the repair of the Stryker. However, Anniston has been unable to obtain sufficient technical data rights, which limits its ability to perform maintenance, even though Anniston participated in the assembly of Stryker vehicles in a partnership arrangement.

Recent changes in law and DOD guidance have addressed the acquisition of technical data. Section 802(a) of the National Defense Authorization Act for Fiscal Year 2007<sup>38</sup> directed the Secretary of Defense to require program managers for major weapon systems and subsystems of major weapon

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<sup>37</sup> GAO, *Weapons Acquisition: DOD Should Strengthen Policies for Assessing Technical Data Needs to Support Weapon Systems*, [GAO-06-839](#) (Washington, D.C.: July 14, 2006).

<sup>38</sup> Pub. L. No. 109-364, §802(a) (2006) (codified at 10 U.S.C. §2320(e)).

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systems to assess the long-term technical data needs of their systems and to establish corresponding acquisition strategies that provide for technical data rights needed to sustain the systems over their life cycle. In July 2007, the Under Secretary of Defense for Acquisition, Technology, and Logistics directed that program managers for ACAT I and II programs assess their long-term technical data needs. Further, the December 2008 update of DOD Instruction 5000.02 requires that a program's long-term technical data needs be reflected in a data management strategy. The data management strategy is to be approved in the context of the acquisition strategy prior to issuing a contract solicitation. It is too soon to determine the impact that this data management initiative may have on the availability of technical data and the establishment of core capabilities.

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## Conclusions

Under the biennial core determination process, DOD lacks assurance that it possesses the core capabilities that are necessary to maintain and repair the weapon systems and other military equipment that are identified as necessary to enable the armed forces to fulfill the strategic and contingency plans prepared by the Chairman, JCS. DOD's core determination process for 2007 did not provide a complete and accurate assessment of core capabilities at military depots. Although DOD reported that more than enough capability existed DOD-wide to support core requirements for fielded systems, the services' data showed that capability shortfalls existed for several equipment/technology categories. An accurate and comprehensive identification of shortfalls is a necessary first step to managing them and taking corrective actions. Further, DOD lacked internal controls to prevent errors and inconsistencies in the military services' implementation of the core determination process, with the result that shortfalls were probably greater than the numbers computed by the military services. In addition, because DOD lacks an effective mechanism for ensuring that corrective actions are taken to manage and reduce core shortfalls for fielded systems, shortfalls in capability can remain unresolved and grow over time. DOD could address most of the shortcomings in the biennial core process by improving its core determination guidance, ensuring service compliance with the guidance, expanding on the internal reporting of core results, and instituting a mechanism to ensure corrective actions are taken when shortfalls in core capability are identified. In addition, visibility and oversight of the core determination process could be enhanced by submitting to Congress the results of the core process, as well as planned corrective actions to address shortfalls.

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Shortcomings in DOD's acquisition guidance and its implementation have resulted in DOD program managers not identifying and establishing required core capability at military depots in a timely manner—capability that will be needed to support future maintenance requirements for new and modified systems. As older fielded systems phase out of the inventory and newer ones are phased in, shortfalls in core capability to support these systems could grow unless DOD acquisition programs change their practices of delaying the identification and establishment of core capability. Since acquisition guidance provides little or no information on how to identify and plan for the establishment of core capability and relatively greater emphasis is placed on using contractor support arrangements, such as performance-based logistics, program managers may continue to focus their sustainment strategies on the use of contractors. For example, the practice of not acquiring or obtaining access to technical data during the weapon system acquisition process has impeded DOD's ability to establish core capabilities at military depots. DOD could improve its acquisition process to provide better assurance that program offices identify and establish core depot maintenance capabilities for new and modified systems in a timely manner. If DOD's acquisition process is not improved and current practices continue, as fielded systems are phased out of the inventory, DOD depots may not be able to provide the ready and controlled source of technical competence they need to ensure an effective, timely response to future national defense emergencies.

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## Recommendations for Executive Action

To improve DOD's ability to assess core logistics capabilities with respect to fielded systems and correct any identified shortfalls in core capability, we recommend that the Under Secretary of Defense for Acquisition, Technology, and Logistics take the following four actions to revise DOD's biennial core instruction:

- Require DOD to compile and report the services' core capability requirements, planned organic workloads, and any shortfalls by equipment/technology category (work breakdown structure).
- Require DOD to implement internal controls to prevent errors and inconsistencies in the services' core calculations. At a minimum, internal controls should address errors and inconsistencies identified in our review on the need to include (1) all JCS-scenario-tasked systems, (2) software maintenance requirements, and (3) only public depot maintenance workload when adjusting for redundancy.



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- Explicitly state the mathematical calculations, based on their core determination worksheets, which the services should use to determine core capability requirements, associated workload, and shortfalls, if any.
  - Require DOD to establish a mechanism to ensure that corrective actions are taken to resolve identified core shortfalls. For example, DOD should institute, in the alternative years of the biennial core process, a status report on the actions taken to resolve shortfalls identified in the previous year.

To provide better assurance that program offices identify and establish core depot maintenance capabilities for new and modified systems in a timely manner, we recommend that the Under Secretary of Defense for Acquisition, Technology, and Logistics take the following four actions:

- Provide program managers with standard operating procedures for performing a core logistics analysis as required in DOD guidance. These standard operating procedures should also ensure that core requirements are considered in conjunction with other sustainment approaches.
- Modify DOD Instruction 5000.02 to incorporate the 4-year time frame for establishing core capability from initial operational capability, as currently required in DOD Directive 4151.18.
- Require that the acquisition strategy for each new and modified system include either a statement that core capability requirements were not identified for the system or, if core requirements were identified, a plan for establishing core capability within 4 years of initial operational capability, including obtaining the required resources.
- Require an initial core assessment early in the acquisition process (preferably prior to Milestone B).

Because DOD has recently updated its guidance to require that a program's long-term technical data needs be reflected in a data management strategy, we are not making a recommendation on this matter.

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## Matter for Congressional Consideration

Congress should consider requiring DOD to report on the status of its effort to maintain a core logistics capability consistent with Section 2464 of Title 10, U.S. Code. In doing so, Congress may wish to require that DOD report biennially on the results of its core determination process, actions taken to correct any identified shortfalls in core capability, and efforts to identify and establish core capability for new and modified systems in a timely manner, consistent with DOD guidance.

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## Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD concurred with eight of our recommendations. DOD partially concurred with one recommendation in the draft report, and we have replaced this recommendation with a matter for congressional consideration. DOD's comments are reprinted in appendix II.

The department stated that DOD Instruction 4151.20, published subsequent to the 2007 core determination process, satisfies many of the recommendations contained in the draft report. We obtained and analyzed the instruction as part of our review, compared it with prior guidance that existed for the 2007 process, and considered it when formulating our findings, conclusions, and recommendations. As noted in the report, the instruction did not depart substantially from the earlier guidance. Therefore, we disagree with DOD that it satisfies many of the recommendations in our report and continue to believe that DOD should take additional actions to implement these recommendations, as discussed further below.

DOD concurred with our recommendations to improve DOD's ability to assess core logistics capabilities with respect to fielded systems and correct any identified shortfalls. Regarding our recommendation that DOD improve its approach to compiling and reporting on core capability requirements, workloads, and shortfalls by equipment/technology category (work breakdown structure), DOD stated that it already conducts an analysis of core requirements and sustaining workloads at the work breakdown structure level. DOD also stated that it tasked the services to provide plans for eliminating shortfalls identified during the 2009 core determination process. We believe that DOD is misconstruing the intent of our recommendation, which was to improve DOD's approach to compiling the service-specific results into a departmentwide assessment. As stated in our report, DOD's internal report on the results of the 2007 process aggregated the services' analyses and did not provide a complete and accurate assessment of core capabilities at military depots, including shortfalls that had been identified in specific equipment/technology categories. Therefore, we continue to believe that DOD should improve its approach to compiling and reporting a departmentwide assessment with the aim of providing greater detail on the results of the core determination process.

Regarding our recommendations on the services' submissions and mathematical calculations used in the core determination process, DOD stated that DOD Instruction 4151.20 provides a consistent format and process for the services to follow in developing their core requirements

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and sustaining workloads. As part of the next data call, DOD plans to reiterate and incorporate our recommendation to prevent errors and inconsistencies in the services' core calculations. DOD further stated that it will provide explicit guidance that the services follow and complete the core calculation worksheets in their entirety. DOD's planned actions should focus more attention on the need to ensure accurate and consistent core submissions and calculations across the services. However, our report notes that the services took different approaches in implementing DOD's core guidance, and DOD Instruction 4151.20 does not substantially change this guidance. Therefore, DOD should take additional steps that we recommended, such as instituting internal controls, for ensuring service compliance with its core determination guidance.

Regarding our recommendation to ensure corrective actions are taken to resolve core capability shortfalls, DOD stated that it (1) has tasked the services with providing plans for eliminating shortfalls identified during the 2009 core determination process and (2) will identify shortfalls as a semi-annual agenda item for a senior-level maintenance steering committee until shortfalls are resolved. As noted in our report, we believe DOD's tasking to the services is a step in the right direction, but falls short of establishing an effective mechanism to ensure that shortfalls are corrected. In addition, on the basis of DOD's comments and information we subsequently obtained about the charter for the steering committee,<sup>39</sup> it is unclear to what extent this entity will provide an effective mechanism to resolve shortfalls. Therefore, while DOD's planned actions are positive steps, DOD may need to take additional actions to fully meet the intent of this recommendation.

DOD partially concurred with a recommendation in our draft report aimed at enhancing the visibility and oversight of the core process. DOD stated that the department will continue to provide Congress with information it

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<sup>39</sup> According to its charter, the Maintenance Executive Steering Committee shall advise the Assistant Deputy Under Secretary (Maintenance Policy and Programs) on initiatives for improving the efficiency, effectiveness, and costs of worldwide maintenance management and operations of the Department of Defense. It shall serve as a mechanism for the coordinated review of DOD maintenance policies, systems, programs, and activities and for jointly planning, monitoring, and evaluating the DOD maintenance program. It will also serve as a forum for the exchange of information among the Assistant Deputy Under Secretary and other officials responsible for the conduct of DOD maintenance operations. The Committee is chaired by the Assistant Deputy Under Secretary and consists of senior maintenance and logistics representatives from the Office of the Secretary of Defense, the Joint Staff, and the Military Services.

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requests for oversight. The department also stated that it plans to make the results of the core determination process available on a DOD Web site. However, DOD was opposed to generating reports to Congress which it has not requested. As we state in the report, Congress does not have readily available and routine visibility of the status of DOD's core capability, including core requirements, associated workloads, and shortfalls, if any exist. As a result, Congress is not in the best position to make oversight decisions, and DOD is not held accountable for the extent to which the military possesses the core logistics capability specified in Section 2464 of Title 10, U.S. Code. Therefore, we have replaced this recommendation with a matter for congressional consideration that DOD be required to report on the status of its effort to maintain a core logistics capability consistent with Section 2464.

DOD concurred with our recommendations to provide better assurance that program offices identify and establish core depot maintenance capabilities for new and modified systems in a timely manner. DOD stated that it will revise guidance in DOD Instruction 5000.02, DOD Directive 4151.18, and the Defense Acquisition Guidebook to provide more specificity on how to identify and establish core capability during the acquisition process. DOD also plans to revise its guidance on the core determination process (DOD Instruction 4151.20) to provide specific core analysis, guidance, and procedures for systems being acquired. Additionally, DOD will issue interim policy until the applicable guidance has been revised. These actions, if implemented, should meet the intent of our recommendations.

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We are sending copies of this report to the appropriate congressional committees and the Secretary of Defense, the Secretaries of the Army, the Navy, the Air Force, and the Commandant of the Marine Corps. In addition, this report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

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Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. If you or your staff have any questions regarding this report, please contact me at (202) 512-8365 or [solisw@gao.gov](mailto:solisw@gao.gov). Key contributors to the report are listed in appendix III.

A handwritten signature in black ink, appearing to read 'W. Solis', with a long horizontal flourish extending to the right.

William M. Solis, Director  
Defense Capabilities and Management

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# Appendix I: Scope and Methodology

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To evaluate the extent to which the DOD has accurately assessed whether it has the required core capabilities in military depots to support fielded systems, we reviewed DOD's core determination process for 2007. We obtained and reviewed guidance that was issued by the Office of the Secretary of Defense (OSD) that was in effect for the 2007 core process, as well as subsequent guidance issued for the 2009 biennial review. We reviewed the military services' implementation of the core determination methodology. We obtained and analyzed their core worksheets showing core capability requirements and associated planned workloads. We determined the extent that the services followed the methodology, and we identified any errors or inconsistencies. Where errors or inconsistencies were identified, however, we did not recalculate core requirements. We obtained OSD's internal report summarizing the results of the 2007 core process and compared it with the worksheet data submitted by the services. In addition, we discussed the core determination process and the results of our data analyses with OSD and service officials. Although our review focused on the 2007 core determination process, we obtained limited information from DOD officials on the 2009 core process, which was ongoing at the time of our review. We also compared the results of the 2007 core process with those of the 2005 process to identify any trends and to determine how identified shortfalls in core capability were being addressed and resolved. One limitation in our methodology was that we did not assess DOD's decisions on the weapon systems that were identified in the Joint Chiefs of Staff (JCS) scenarios. Inaccurate tasking of weapon systems could have the effect of either overstating or understating core capability requirements for fielded systems.<sup>1</sup> We also reviewed our prior reports on core capability and depot maintenance issues, as well as related reports issued by service audit agencies and research organizations.

To determine the extent to which DOD is preparing to support future core requirements for new and modified systems in military depots, we examined pertinent DOD guidance, including acquisition guidance in DOD's 5000 series of directives and instructions, DOD guidance for managing military materiel, and service acquisition policies. To obtain information on the identification of core requirements for new and modified systems, we asked the services to identify systems that were in

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<sup>1</sup> If DOD omitted weapon systems from its JCS scenarios that should have been tasked, then its core capability requirements may have been understated. Conversely, if DOD tasked weapon systems that would not be needed for a scenario, then its core capability requirements may have been overstated.

the acquisition process during 2006. Due to DOD data limitations, we could not verify that the services included all systems meeting our criteria. We then surveyed program managers about whether they had conducted a core analysis for their system. We received responses from 112 program managers, including 52 who responded that they had performed a core analysis or source of repair analysis.<sup>2</sup> We conducted additional follow-up audit work with the 52 who responded that they had completed a core analysis. We did not assess the rationale for the decisions made on identifying the systems' core requirements. However, we collected comments from OSD and service officials and examined service documents on the factors that complicate program managers' decisions to identify core requirements during the acquisition process.

To determine whether the services established core logistics capabilities for new and modified systems for which a core requirement had been identified, we reviewed systems that had completed the acquisition process and were in operation between 1998 and 2003. From a total population of 662 systems that met these criteria, we randomly selected 53 systems and judgmentally selected another 20 systems. From this list of 73 systems, we subsequently excluded 43 weapon systems for various reasons, as shown in table 6, leaving a total of 30 systems. Because the selected systems do not represent a statistical sample, results from nongeneralizable samples cannot be used to make inferences about a population.

**Table 6: Explanations for Why 43 Systems Were Excluded from Our Review**

Reason for exclusion	Number of systems excluded
Initial operational capability date outside of the time frame <sup>a</sup>	13
No depot repair capability required	13
Not tasked in JCS scenarios	12
Commercial off-the-shelf item	5
<b>Total systems excluded</b>	<b>43</b>

Sources: GAO analysis of DOD data.

<sup>a</sup>Systems with an initial operational capability date after 2003 were excluded because we were precluded from determining whether the department would achieve the depot capability within the 4-year window.

<sup>2</sup> For the remaining 60 systems, the program managers responded that they had not completed core analyses or source of repair analysis for their systems.

We further reviewed the 30 systems to determine whether core capabilities were established at military depots within 4 years of their initial operational capability date. We reviewed various program documents, including source-of-repair decisions and maintenance plans, and interviewed program officials about the characteristics of the systems and maintenance sustainment decisions. Further, we examined Defense Acquisition Board documents for some of the selected weapon systems to determine if core capabilities were recorded when future sustainment agreements were discussed in acquisition reviews.

We assessed the reliability of the data from the services' databases that we used to conduct our review and determined that the DOD data were sufficiently reliable for the purposes of our analysis and findings. While the results of these reviews cannot be generalized to all weapon systems in the acquisition process, deficiencies in the way core capability is identified or established for these systems indicate the existence of more widespread problems. Further, we did not look at the larger question of whether DOD fulfilled the warfighter's requirements as part of our review.

In conducting work for both objectives, we interviewed officials and obtained documentation, when applicable, at the following locations:

- Office of the Secretary of Defense, Washington, D.C.
- Joint Chiefs of Staff, Washington, D.C.
- Air Force Headquarters, Washington, D.C.
- Air Force Materiel Command, Ohio
- Oklahoma City Air Logistics Center, Oklahoma
- Warner Robins Air Logistics Center, Georgia
- Army Headquarters, Washington, D.C.
- Army Materiel Command, Virginia
- Anniston Army Depot, Alabama
- Corpus Christi Army Depot, Texas
- Tobyhanna Army Depot, Pennsylvania
- U.S. Army Aviation and Missile Command, Alabama
- U.S. Army Communications and Electronics Command, New Jersey
- TACOM Life Cycle Management Command, Michigan
- Marine Corps Systems Command, Virginia
- Marine Corps Logistics Command, Georgia
- Navy Headquarters, Washington, D.C.
- Naval Air Systems Command, Maryland
- Fleet Readiness Center East, North Carolina
- Naval Sea Systems Command, District of Columbia
- Norfolk Naval Shipyard, Virginia



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We conducted this performance audit from June 2007 through March 2009 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 the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

# Appendix II: Comments from the Department of Defense



DEPUTY UNDER SECRETARY OF DEFENSE FOR  
LOGISTICS AND MATERIEL READINESS  
3500 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3500

April 28, 2008

Mr. William M. Solis  
Director, Defense Capabilities and Management  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

Dear Mr. Solis:

This is the Department of Defense (DoD) response to the GAO Draft Report, "DEPOT MAINTENANCE: Actions Needed to Identify and Establish Core Capability of Military Depots," dated March 30, 2009 (GAO Code 351072/GAO-09-83).

The GAO review and draft report were based on data collected from the Fiscal Year 2007 Core data call. DoD Instruction 4151.20, *Depot Maintenance Core Capabilities Determination Process*, published subsequent to the FY 2007 submissions, establishes the core determination process as policy and satisfies many of the recommendations contained in the draft report. The Department concurs, or partially concurs with all recommendations. An explanation of the DoD position is enclosed.

The Department appreciates the opportunity to comment on the draft report.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan F. Estevez".

Alan F. Estevez  
Acting

Enclosure:  
As stated



GAO DRAFT REPORT – DATED MARCH 30, 2009  
GAO CODE 351072/GAO-09-83

"DEPOT MAINTENANCE: Actions Needed to Identify  
and Establish Core Capability at Military Depots"

DEPARTMENT OF DEFENSE COMMENTS  
TO THE RECOMMENDATIONS

**RECOMMENDATION 1:** The GAO recommends that the Under Secretary of Defense for Acquisition, Technology, and Logistics require DoD to compile and report the Services' core capability requirements, planned organic workloads, and any shortfalls by equipment/technology category (work breakdown structure).

**DOD RESPONSE:** Concur. The DoD already conducts an analysis of core requirements and sustaining workloads at the work breakdown structure level. Shortfalls were identified in the initial FY 2009 Service submissions and the Services have been tasked to provide plans that eliminate those shortfalls.

**RECOMMENDATION 2:** The GAO recommends that the Under Secretary of Defense for Acquisition, Technology, and Logistics require DoD to implement internal controls to prevent errors and inconsistencies in the Services' core calculations. At a minimum, internal controls should address errors and inconsistencies identified in the GAO review regarding the need to include: (1) all Joint Chiefs of Staff-scenario-tasked systems; (2) software maintenance requirements; and (3) only public depot maintenance workload when adjusting for redundancy.

**DOD RESPONSE:** Concur. DoDI 4151.20, *Depot Maintenance Core Capabilities Determination Process*, published subsequent to the FY 2007 submissions established the core determination process as policy. The Instruction provides a consistent format and process for the Services to follow in developing their core requirements and sustaining workloads. The Department will reiterate and incorporate the recommendations above into the next core data call.

**RECOMMENDATION 3:** The GAO recommends that the Under Secretary of Defense for Acquisition, Technology, and Logistics explicitly state the mathematical calculations, based on their core determination worksheets that the Services should use to determine core capability requirements, associated workload, and shortfalls, if any.

**DOD RESPONSE:** Concur. DoDI 4151.20, *Depot Maintenance Core Capabilities Determination Process*, published subsequent to the FY 2007 submissions, established the core determination process as policy. The Instruction provides a consistent format and process for the Services to follow in developing their core requirements and sustaining workloads. A specific worksheet is included in the DoDI along with specific instructions for filling out each block. For instance, the instruction for Block H reads, "E2.2.1.10. Block H – Total Adjusted Requirements.

Record the net adjusted requirements in Column H of the worksheet (Part 1), Table E2.T1. Carry this information forward to the workload identification process described in Block K (see subparagraph E2.2.2.5.)” The Department will provide explicit guidance that these worksheets are to be followed and completed in their entirety.

**RECOMMENDATION 4:** The GAO recommends that the Under Secretary of Defense for Acquisition, Technology, and Logistics require DoD to establish a mechanism to ensure that corrective actions are taken to resolve identified core shortfalls. For example, DoD should institute, in the alternative years of the biennial core process, a status report on the actions taken to resolve shortfalls identified in the previous years.

**DOD RESPONSE:** Concur. Identified core sustaining workload shortfalls will be a semi-annual agenda item for the Maintenance Executive Senior Steering Group until shortfalls are resolved

**RECOMMENDATION 5:** The GAO recommends that the Secretary of Defense provide Congress (1) the results of the biennial process to include core requirements, planned workload, and any shortfalls by Service and equipment/technology category, along with the plans and funding required to rectify any shortfalls, and (2) an interim year report of the Department’s progress for resolving core capability shortfalls.

**DOD RESPONSE:** Partially concur. The Department will continue to provide the Congress with the information they request in order to provide oversight. Information regarding the results of the biennial process will be available on the Maintenance Policy and Programs website. The Department does not recommend generating reports to the Congress which they have not requested.

**RECOMMENDATION 6:** The GAO recommends that the Under Secretary of Defense for Acquisition, Technology, and Logistics provide program managers with standard operating procedures for performing a core logistics analysis as required in DoD guidance. These standard operating procedures should also ensure that core requirements are considered in conjunction with other sustainment approaches.

**DOD RESPONSE:** Concur. DoD instruction DoDI 4151.20, *Depot Maintenance Core Capabilities Determination Process* will be revised to provide specific core analysis, guidance and procedures for systems in acquisition. DoDI 5000.02, *Operation of the Defense Acquisition System*, December 8, 2008, already requires the conduct of a Core Logistics Analysis prior to Milestone B (or Milestone C if there was no Milestone B). However, DoDI 5000.02 will be modified to correctly reference the necessity to conduct a core capability assessment and analysis in accordance with the provisions of DoDD 4151.18 and DoDI 4151.20. The Defense Acquisition Guidebook will also be updated to provide additional amplification. Interim policy will be issued until the DoD instructions and Defense Acquisition Guidebook can be revised.

**RECOMMENDATION 7:** The GAO recommends that the Under Secretary of Defense for Acquisition, Technology, and Logistics modify DoDI 5000.02 to incorporate the 4-year timeframe for establishing core capability from initial operational capability, as currently required in DoD Directive 4151.18.

**DOD RESPONSE:** Concur. DoDI 5000.02, *Operation of the Defense Acquisition System*, December 8, 2008, will be revised to correctly reference the necessity to conduct a core capability assessment and analysis in accordance with the provisions of DoDD 4151.18 and DoDI 4151.20, which already incorporate the requirement for the 4-year timeframe for establishing core capability from initial operational capability. The Defense Acquisition Guidebook will also be updated to reflect this requirement. Interim policy will be issued until the DoD instruction and Defense Acquisition Guidebook can be revised.

**RECOMMENDATION 8:** The GAO recommends that the Under Secretary of Defense for Acquisition, Technology, and Logistics require that the acquisition strategy for each new and modified system include either a statement that core capability requirements were not identified for the system or, if core requirements were identified, a plan for establishing core capability within 4 years of initial operational capability, including obtaining the required resources.

**DOD RESPONSE:** Concur. DoDI 5000.02, *Operation of the Defense Acquisition System*, December 8, 2008, will be revised to reflect a requirement to document the results of the Core Logistics Analysis/Source of Repair Analysis prior to Milestone B (or prior to Milestone C if there was no Milestone B). The Defense Acquisition Guidebook will also be updated to provide additional amplification. Interim policy will be issued until the DoD instruction and Defense Acquisition Guidebook can be revised.

**RECOMMENDATION 9:** The GAO recommends that the Under Secretary of Defense for Acquisition, Technology, and Logistics require an initial core assessment early in the acquisition process (preferably prior to Milestone B).

**DOD RESPONSE:** Concur. DoDI 4151.20, *Depot Maintenance Core Capabilities Determination Process* will be modified to provide specific core analysis, guidance and procedures to the Program Managers. Direction will include the requirement to identify the existence of core capability requirements and determine candidate organic depots for depot-level maintenance not later than Milestone B of the acquisition process. For those programs entering the acquisition process at Milestone C, core and candidate organic depot determinations shall be made no later than 90 days following notification of program approval. These requirements are already included in DoDI 5000.02. The Defense Acquisition Guidebook will also be updated to provide additional amplification. Interim policy will be issued until the DoD instructions and Defense Acquisition Guidebook can be revised.

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# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact

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## Acknowledgments

In addition to the contact named above, Julia Denman and Tom Gosling, Assistant Directors; Carleen Bennett; Grace Coleman; Susan Ditto; David Epstein; Chanee Gaskin; Dawn Godfrey; Katherine Lenane; Shawnda Lindsey; Randy Neice; Geoffrey Peck; Terry Richardson; and John Trubey made key contributions to this report.

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