



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

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April 2015

# DEFENSE INVENTORY

Services Generally  
Have Reduced  
Excess Inventory, but  
Additional Actions Are  
Needed

Accessible Version

## DEFENSE INVENTORY

### Services Generally Have Reduced Excess Inventory, but Additional Actions Are Needed

Highlights of [GAO-15-350](#), a report to the Subcommittee on Readiness, Committee on Armed Services, House of Representatives

#### Why GAO Did This Study

The Army, Navy, and Air Force are responsible for about \$78 billion of DOD's \$98 billion in secondary item inventory, such as spare parts needed to maintain military equipment. GAO identified DOD supply chain management as a high-risk area due in part to ineffective and inefficient inventory management practices that have contributed to high levels of excess inventory relative to total inventory. DOD established goals to reduce the percentages of both on-hand and on-order excess inventory.

GAO was asked to review DOD's inventory management practices. This report assesses the extent to which the services have (1) reduced on-hand excess inventory consistent with DOD goals, (2) reduced on-order excess inventory consistent with DOD goals, (3) balanced the timely availability of spare parts with supply chain costs in their inventory management metrics, and (4) implemented and monitored key improvement efforts. GAO analyzed inventory data from September 2009 through March 2014; evaluated the services' inventory processes; and interviewed service and OSD officials.

#### What GAO Recommends

GAO is making seven recommendations to OSD and the services to improve the effectiveness and efficiency of inventory management practices, including addressing reporting issues that limit visibility of inventory and identified management weaknesses. DOD concurred with GAO's recommendations.

View [GAO-15-350](#). For more information, contact Zina Merritt at (202) 512-5257 or [merrittz@gao.gov](mailto:merrittz@gao.gov).

#### What GAO Found

The Navy and Air Force reported meeting the Department of Defense's (DOD) goal of reducing on-hand excess inventory (i.e., items categorized for potential reuse or disposal) to 10 percent of the total value of inventory, but the Army had not met the goal, as of March 2014. Reporting issues hinder full visibility of on-hand excess inventory and progress against DOD's goal. For example,

- the Army's calculation of its inventory to meet requirements was not in accordance with Army guidance and resulted in potentially underreporting its amount of on-hand excess inventory to the Office of the Secretary of Defense (OSD);
- the Navy's and Air Force's calculations of on-hand excess inventory included contractor-managed inventory at the direction of OSD, which resulted in the appearance that these services had made greater progress in reducing their on-hand excess inventory than they actually had;
- an internal Army goal for reducing its total inventory was not based on an analysis of inventory data consistent with standards for internal control, potentially misleading Army efforts to dispose of inventory; and
- the Air Force identified about \$2.6 billion in inventory that was retained without proper economic justification and plans to continue to retain it until late 2016, resulting in the Air Force paying to store inventory that may not be needed.

The Air Force has reported generally meeting DOD's goal of reducing on-order excess inventory (i.e., already purchased items that may be excess due to subsequent changes in requirements) to 6 percent of the total value of on-order inventory, but the Army and Navy had not met the goal, as of March 2014. Army and Navy management weaknesses pose challenges in reducing on-order excess inventory and meeting DOD's goal. For example,

- the Army has not established goals for reducing on-order excess inventory in accordance with standards for internal control; and
- the Navy does not use management reviews of potential on-order excess inventory based on dollar thresholds, as required by DOD guidance, resulting in a lack of oversight of on-order excess inventory.

In accordance with DOD guidance, the services use metrics that generally balance availability of spare parts with supply chain costs to assess their overall performance. The services' metrics balance several areas, including customer service, cost, and internal efficiency. Their customer-service metrics center on the availability of spare parts and backorders (i.e., part shortages). Their cost metrics measure financial aspects of inventory management, such as monthly sales of spare parts. The services also monitor internal efficiency metrics, such as the accuracy of demand forecasts (i.e., predicting future customer demand so managers can develop requirements to satisfy demands when they occur) for spare parts.

The services have efforts to improve and monitor demand forecasting and acquisition lead times (i.e., the time interval between identifying a need to purchase an item and delivering that item to the customer). The services have taken different approaches in these areas, and their efforts are in various stages of implementation.

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# Contents

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Letter	1
Background	7
The Services Have Reported Generally Meeting DOD's Goal for Reducing On-Hand Excess Inventory, but Reporting Issues Hinder Visibility of Progress	12
Services Have Had Mixed Success at Meeting DOD's Goal for Reducing On-Order Excess Inventory, and the Army and Navy Processes Have Management Weaknesses	26
Service Metrics Generally Balance Availability of Spare Parts and Supply Chain Costs	37
The Services Have Efforts Focused on Improving and Monitoring Demand Forecasting and Acquisition Lead Times	42
Conclusions	51
Recommendations for Executive Action	53
Agency Comments and Our Evaluation	54
<hr/>	
Appendix I: The Department of Defense's (DOD) Inventory Improvement Plan	56
Background	56
Oversight of the Plan's Implementation	56
Goals of the Plan	56
The Structure of the Plan	56
<hr/>	
Appendix II: Scope and Methodology	59
Appendix III: Additional Service Efforts to Improve Inventory Management	65
Appendix IV: Value of the Services' On-Order and On-Order Excess Inventory	69
Appendix V: Actions Taken by the Services to Reduce Backorders	70
The Army Slightly Decreased Its Backorders and Has Established a Goal for Decreasing Backorders	70
The Navy Has Reduced Total Backorders, but Some Maritime Backorders Are Increasing	71
The Air Force Has Reduced Backorders in Recent Years	73

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Appendix VI: The Services Have Efforts Focused on Improving and Monitoring Demand Forecasting	74
Appendix VII: The Services Have Efforts Focused on Improving and Monitoring Acquisition Lead Times	78
Appendix VIII: Comments from the Department of Defense	81
Appendix IX: GAO Contact and Staff Acknowledgments	85
GAO Contact	85

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Appendix X: Accessible Data	86
Related GAO Products	88

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Tables

Table 1: Value of Total Department of Defense Inventory and Army, Navy, and Air Force Inventories, Fiscal Years 2009-2013 (nominal dollars in billions)	9
Table 2: Army, Navy, and Air Force On-Order Excess Inventory Percentages, 2010–2014	28
Table 3: Examples of Regularly Reviewed Metrics in Each Category by Service	39
Table 4: Service Quarterly Performance on Average Variance Metric for Acquisition Lead Time, April 2013–March 2014	48
Table 5: Acquisition Lead Time Variance Distribution, January–March 2014	49
Table 6: The Nine Subplans and Corresponding Objectives	57
Table 7: The Services' Value of On-Order and On-Order Excess Inventory, 2012–2014	69
Data Table for Figure 1: Navy On-Hand Excess Inventory, 2012–2014 (Nominal Dollars in Billions)	86
Data Table for Figure 2: Air Force On-Hand Excess Inventory, 2010–2014 (Nominal Dollars in Billions)	86
Data Table for Figure 3: Demand Forecast Accuracy Performance by Service	86
Data Table for Figure 4: Demand Forecast Bias by Service	86
Data for Figure 5: Overview of Army Sales and Operations Planning Meetings and Process	87

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## Figures

Figure 1: Navy On-Hand Excess Inventory, 2012–2014 (Nominal Dollars in Billions)	18
Figure 2: Air Force On-Hand Excess Inventory, 2010–2014 (Nominal Dollars in Billions)	19
Figure 3: Demand Forecast Accuracy Performance by Service	44
Figure 4: Demand Forecast Bias by Service	45
Figure 5: Overview of Army Sales and Operations Planning Meetings and Process	66

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### Abbreviations

DOD	Department of Defense
MICAP	Mission Impaired Capability Awaiting Parts
OSD	Office of the Secretary of Defense
S&OP	Sales and Operations Planning

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April 20, 2015

The Honorable Rob Wittman  
Chairman  
The Honorable Madeleine Z. Bordallo  
Ranking Member  
Subcommittee on Readiness  
Committee on Armed Services  
House of Representatives

The Department of Defense (DOD) manages more than 5 million secondary inventory items (hereafter referred to as inventory), including spare parts and other items, with a reported value of approximately \$98 billion as of September 2013.<sup>1</sup> The Army, Navy, and Air Force are responsible for about \$78 billion, or four-fifths, of DOD's inventory, specifically reparable items and other supplies needed to keep its military equipment ready and operating.<sup>2</sup> DOD issued strategic guidance in January 2012 that, among other things, emphasized the need to reduce its cost of doing business, in particular by finding efficiencies in overhead, business practices, and support activities.<sup>3</sup> Furthermore, the Secretary of Defense's 2013 Strategic Choices Management Review, which explored defense strategy and management options in the face of continuing budget cuts, concluded that DOD needs to continue efforts to reduce overhead and become more efficient. The budgetary environment and

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<sup>1</sup>DOD defines secondary inventory items as reparable components, subsystems, assemblies, consumable repair parts, bulk items and materiel, subsistence, and expendable end items (e.g., clothing and other personal gear). In this report, we refer to secondary inventory items as inventory. Year-end data for fiscal year 2013 were the most recent department-wide available at the time of this report. Unless otherwise stated, all dollar figures in this report are in nominal terms.

<sup>2</sup>Reparable items are items that can be repaired and reused multiple times. These are contrasted with consumable items, such as a screw or bolt, that are not intended to be reused. The Defense Logistics Agency manages almost all of the remaining \$20 billion of DOD's inventory. The Navy manages aviation spare parts for the Marine Corps' helicopters and airplanes. The Marine Corps manages its own nonaviation spare parts, which in 2013 were valued at approximately \$930 million, or less than 1 percent of the value of DOD's secondary inventory.

<sup>3</sup>Secretary of Defense, Department of Defense, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense*, (Jan. 5, 2012).

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strategic management efforts underscore the importance of effective and efficient inventory management that supports the readiness of the force and avoids spending resources on unneeded inventory that could be better applied to other defense and national priorities.

Since 1990, we have identified DOD supply chain management as a high-risk area due in part to ineffective and inefficient inventory management practices and procedures, weaknesses in accurately forecasting the demand for spare parts, and other supply chain challenges.<sup>4</sup> Our work has shown that these factors have contributed to the accumulation of billions of dollars in spare parts that are excess to current needs.<sup>5</sup> We found in May 2012 that DOD had made progress in reducing its excess inventory and implementing its *Comprehensive Inventory Management Improvement Plan*, which was developed and implemented in response to a provision of the National Defense Authorization Act for Fiscal Year 2010.<sup>6</sup> The Office of the Secretary of Defense (OSD) continues to monitor the progress and results from implementing the *Comprehensive Inventory Management Improvement Plan* through regular reviews with the services and the Defense Logistics Agency. For example, OSD monitors changes in the amount of excess inventory that they report, as well as other indicators of effective and efficient inventory management, including the number of backorders (i.e., part shortages) affecting weapon system readiness. In addition, OSD monitors progress in addressing specific areas of inventory management identified in the *Comprehensive*

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<sup>4</sup>DOD's supply chain is a global network that provides materiel, services, and equipment to the joint force. Supply chain management encompasses the processes and systems for delivering the right items to the right place at the right time, and at the right cost. DOD's inventory management was included in GAO's original list of high-risk areas, which was communicated to Congress by letter (Jan. 23, 1990). DOD inventory management was redesignated as DOD supply chain management in GAO's 2005 update to its High-Risk Series. For our most recent update, see GAO, *High-Risk Series: An Update*, [GAO-15-290](#) (Washington, D.C.: Feb. 11, 2015).

<sup>5</sup>[GAO-15-290](#); GAO, *High-Risk Series: An Update*, [GAO-13-283](#) (Washington, D.C.: February 2013); *Opportunities to Reduce Potential Duplication in Government Programs, Save Tax Dollars, and Enhance Revenue*, [GAO-11-318SP](#) (Washington, D.C.: Mar. 1, 2011); *High-Risk Series: An Update*, [GAO-11-278](#) (Washington, D.C.: February 2011); *High-Risk Series: An Update*, [GAO-09-271](#) (Washington, D.C.: January 2009); *High-Risk Series: An Update*, [GAO-07-310](#) (Washington, D.C.: January 2007); and *High Risk-Series: An Update*, [GAO-05-207](#) (Washington, D.C.: January 2005).

<sup>6</sup>GAO, *Defense Inventory: Actions Underway to Implement Improvement Plan, but Steps Needed to Enhance Efforts*, [GAO-12-493](#) (Washington, D.C.: May 3, 2012).

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*Inventory Management Improvement Plan*, including efforts aimed at improving demand forecast accuracy and reducing acquisition lead time.<sup>7</sup>

In the *Comprehensive Inventory Management Improvement Plan*, which runs into fiscal year 2016, DOD established overarching goals to reduce the department's percentage of on-hand excess inventory—those items categorized for potential reuse or disposal—and on-order excess inventory—those items already purchased but that may be excess due to subsequent changes in requirements.<sup>8</sup> We reported in May 2012 that DOD was exceeding its initial goals for reducing excess inventory; thus, we recommended that DOD establish more challenging, but achievable, goals for reducing excess inventory and periodically reexamine and update its goals. DOD concurred and, in response, revised its on-hand excess inventory goal from 10 percent of the total value of inventory to 8 percent by fiscal year 2016. However, DOD did not make any changes to its on-order excess inventory goals and maintained that its goals of 6 percent of the total value of on-order inventory by 2014 and 4 percent by 2016 are sufficient. We provide further information about DOD's *Comprehensive Inventory Management Improvement Plan* in appendix I.

You requested that we evaluate the inventory management of the Army, Navy, and Air Force. This report assesses the extent to which the services have (1) reduced on-hand excess inventory consistent with DOD goals, (2) reduced on-order excess inventory consistent with DOD goals, (3) balanced the timely availability of spare parts with supply chain costs in their inventory management metrics in accordance with DOD guidance, and (4) implemented and monitored demand forecast accuracy and acquisition lead time improvement efforts.

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<sup>7</sup>Demand forecasting is the act of predicting future customer demands so inventory managers can develop inventory requirements to satisfy demands when they occur. Inaccurate forecasts lead to either excess inventory or shortfalls. Acquisition lead time is the time interval between identifying a need to purchase an item and delivering that item to the customer. Acquisition lead times have two primary components: administrative lead time, which is the time between identifying the need to purchase and the award of a contract, and production lead time, which is the time between when the contract is awarded and when the item is delivered to the customer. Longer lead times can increase acquisition quantities and costs as well as potentially lead to the accumulation of excess inventory.

<sup>8</sup>On-hand inventory is in DOD's possession, whereas on-order inventory is not in DOD's possession but a contract has been awarded or funds have been obligated for the inventory.

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This is the second of two reviews examining DOD's inventory management. In June 2014, we reported on the Defense Logistics Agency's inventory management and made a number of recommendations, such as establishing on-order excess inventory goals at its subordinate commands and having senior management regularly monitoring progress in reducing on-order excess inventory.<sup>9</sup> DOD concurred with our eight recommendations, and the Defense Logistics Agency has begun to take actions to implement these recommendations. In addition, in an October 2014 letter to the Acting Assistant Secretary of Defense for Logistics and Materiel Readiness, we identified steps that the department should take to address high-risk issues including its inventory management. These steps included, among other things, taking actions to diagnose and address, as appropriate, an increase in the department-wide percentage of on-order excess inventory, enhancing management and oversight of its inventory to ensure that disposal decisions are analytically supported and consistent with department guidance, and continuing to implement and monitor improvements in its demand forecasting.

To assess the extent to which the Army, Navy, and Air Force have reduced on-hand and on-order excess inventory, we analyzed the services' year-end inventory data, as available, for fiscal years 2009 through 2013 as well as mid-year data from March 2014.<sup>10</sup> We selected this time frame because fiscal year 2009 data were used as the baseline for the *Comprehensive Inventory Management Improvement Plan* and March 2014 data were the latest available at the time we conducted our field work. To assess the reliability of the data, we reviewed DOD requirements for secondary spare parts inventory reporting, compared service-provided data with summary tables, searched for and reconciled inconsistent information, and discussed the services' data and our findings with service officials responsible for overseeing the data. We determined the services' inventory data that we include in this report were sufficiently reliable for determining the services' amount of inventory and reasons for holding that inventory. For on-hand and on-order excess inventory, we compared the results of our data analysis with DOD's

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<sup>9</sup>GAO, *Defense Inventory: Actions Needed to Improve the Defense Logistics Agency's Inventory Management*, [GAO-14-495](#) (Washington, D.C.: June 19, 2014).

<sup>10</sup>This report does not address the Marine Corps' inventory management.

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excess goals and DOD guidance.<sup>11</sup> Also, we compared our analysis for on-hand excess inventory and the services' processes for on-order excess inventory with applicable Standards for Internal Control in the Federal Government<sup>12</sup> and results-oriented management practices,<sup>13</sup> which emphasize reviewing and validating performance measures to ensure the metrics are measuring the intended outcome, reviewing performance measures and progress achieving goals at the functional or activity level, and linking goals of component organizations to departmental strategic goals. We also examined performance management briefings that included documentation related to the services' efforts to manage its inventory; inventory management policies and procedures; and other reports and analyses related to the services' inventory management. We interviewed Army, Navy, and Air Force officials responsible for inventory management to discuss their efforts to reduce excess inventory. Additionally, we met with officials from OSD to discuss the services' efforts.

To assess the extent to which the Army, Navy, and Air Force balanced the timely availability of spare parts with supply chain costs in their inventory management metrics, we reviewed documentation from service performance management meetings and analyzed the services' use of metrics to manage their inventory against DOD guidance. This guidance

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<sup>11</sup>Department of Defense Manual 4140.01, Volume 3, *DOD Supply Chain Materiel Management Procedures: Materiel Sourcing* (Feb. 10, 2014), and Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting* (Feb. 10, 2014). Volume 3 requires, among other things, the services to establish a management process for excess on-order assets that seeks to minimize those excess assets where cost-effective and in the best interests of the U.S. Government. Specifically, DOD guidance requires that the management process for on-order excess inventory include graduated levels of review based on dollar thresholds for deciding when to reduce, cancel, or retain on-order excess assets. Volume 10 requires the services to stratify and report inventory data biannually as of March 31 and September 30 and use the inventory stratification data to assess the ability of the inventory to meet the stated requirement and ensure that surplus inventories are only kept if warranted.

<sup>12</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

<sup>13</sup>GAO, *Managing for Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005). In that report, we reviewed relevant literature and interviewed officials from five federal agencies to identify uses of performance information and practices that encourage the use of performance information. Based on this work, we then developed a conceptual framework identifying four categories of uses of performance information and five categories of practices that contribute to using performance information.

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requires the services to be responsive to customer requirements while balancing risk and costs, conduct periodic performance and cost evaluations, and adopt metrics that provide information on customer service, cost, and internal efficiency.<sup>14</sup> Specifically, we assessed a service as using a particular type of metric providing information on customer service, cost, or internal efficiency if the metric was a regular part of service inventory management performance reviews. We also conducted interviews with service and OSD officials to understand and corroborate the use of performance metrics to inform inventory management decisions.

To determine the extent to which the services have implemented and monitored efforts to improve demand forecast accuracy and acquisition lead times, we identified each service's efforts and analyzed these efforts in conjunction with broader DOD efforts described in the *Comprehensive Inventory Management Improvement Plan*. We focused on demand forecasting and acquisition lead time efforts because our prior body of work and third parties have identified these issues as key weaknesses in DOD's inventory practices, and DOD has also emphasized these issues in its improvement efforts.<sup>15</sup> We obtained available information from each of the services, including briefings prepared by service officials on how demand forecast accuracy and acquisition lead times have changed since improvement efforts began, the status of these efforts, and program or timeline risks associated with implementing the efforts. We interviewed

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<sup>14</sup>DOD Instruction 4140.01, *Supply Chain Materiel Management Policy* (Dec. 14, 2011), and DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting* (Feb. 10, 2014).

<sup>15</sup>With respect to demand forecasting, see GAO, *Defense Inventory: Defense Logistics Agency Needs to Expand on Efforts to More Effectively Manage Spare Parts*, [GAO-10-469](#) (Washington, D.C.: May 11, 2010); *Defense Inventory: Army Needs to Evaluate Impact of Recent Actions to Improve Demand Forecasts for Spare Parts*, [GAO-09-199](#) (Washington, D.C.: Jan. 12, 2009); and *Defense Inventory: Management Actions Needed to Improve the Cost Efficiency of Navy's Spare Parts Inventory*, [GAO-09-103](#) (Washington, D.C.: Dec. 12, 2008); Logistics Management Institute, *Lifecycle Forecasting Improvement: Causative Research and Item Introduction Phase* (November 2010); Accenture, *Sustainment Lifecycle Phase Forecasting and the Impact on Business Outcomes* (July 2013); and Accenture, *Retirement Lifecycle Phase Forecasting and the Impact on Business Outcomes* (February 2014). With respect to acquisition lead times, see GAO, *Defense Inventory: Opportunities Exist to Improve Management of DOD's Acquisition Lead Times for Spare Parts*, [GAO-07-281](#) (Washington, D.C.: Mar. 2, 2007), and RAND National Defense Research Institute, *Integrating the Department of Defense Supply Chain* (2012).

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officials from each of the services to determine the expected outcome or effect for individual initiatives and, if available, implementation schedules, steps taken to implement the initiatives, and progress made in achieving desired results. Additionally, we interviewed officials from OSD about the services' efforts, if any, related to improving demand forecast accuracy and acquisition lead times as well as the implementation of other initiatives to improve inventory management. Appendix II provides further information on our scope and methodology.

We conducted this performance audit from October 2013 to April 2015 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 audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

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### DOD Inventory Management Structure

The DOD supply chain is a global network that provides materiel, services, and equipment to the joint force. Inventory management, a key component of the DOD supply chain, is the process of determining requirements and procuring, managing, cataloging, distributing, overhauling, and disposing of materiel. Management and oversight of DOD inventory is a responsibility shared among the Under Secretary of Defense for Acquisition, Technology and Logistics within OSD; the Defense Logistics Agency; and the services. The Under Secretary of Defense for Acquisition, Technology and Logistics and its subordinate, the Assistant Secretary of Defense for Logistics and Materiel Readiness, are responsible for developing materiel management policies and ensuring their implementation in a uniform manner throughout the department, while the Defense Logistics Agency and the services are responsible for implementing DOD policies and procedures for materiel management.<sup>16</sup> The Defense Logistics Agency manages mostly consumable items—those that are normally expended or intended to be

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<sup>16</sup>In this report, we refer to the Assistant Secretary of Defense for Logistics and Materiel Readiness and its subordinate organizations, such as the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration, as OSD.

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used up beyond recovery or repair—for the military services.<sup>17</sup> The services manage mostly reparable items—items that are generally more cost-effective to repair and reuse than to dispose of and replace by procuring a new item—and each service has its own organizations responsible for managing inventory.

The Army manages materiel support, including spare parts and other inventory items, through the Army Materiel Command. Within Army Materiel Command, major subordinate commands with responsibility for secondary inventory include its life-cycle management commands, specifically the Aviation and Missile Command, Communications-Electronics Command, and Tank-automotive and Armaments Command. These commands are responsible for developing, acquiring, and sustaining the weapon systems under their control.

The Navy manages materiel support through the Naval Supply Systems Command and Naval Supply Systems Command Weapon Systems Support. Naval Supply Systems Command establishes supply chain and inventory management policy and guidance. Naval Supply Systems Command Weapon Systems Support is responsible for providing supply support for maritime and aviation weapon systems for Navy, Marine Corps, joint, and allied forces.

The Air Force manages materiel support through the Air Force Materiel Command. Primary responsibility for managing Air Force secondary inventory is delegated to the command's Air Force Sustainment Center. The Air Force Sustainment Center has responsibility for the management and operations wings that oversee most secondary inventory and for air logistics complexes that perform maintenance on weapon systems. The Air Force Sustainment Center's 448th Supply Chain Management Wing manages spare parts that support various functions across the Air Force supply chain.

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## DOD and Service Inventory Value

DOD reported that the total value of its inventory was about \$98 billion as of the end of fiscal year 2013 (see table 1). In fiscal year 2013, the Army, Navy, and Air Force inventory was valued at \$17.7 billion, \$24.2 billion, and \$36.5 billion, respectively. The value of Army inventory decreased by

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<sup>17</sup>See [GAO-14-495](#) for additional information on the Defense Logistics Agency's inventory management practices.

about \$4.7 billion since 2009 while the value of the Navy and Air Force inventory increased by \$2.5 billion and \$8.3 billion, respectively.

**Table 1: Value of Total Department of Defense Inventory and Army, Navy, and Air Force Inventories, Fiscal Years 2009-2013 (nominal dollars in billions)**

Fiscal year	Value of DOD inventory <sup>a</sup>	Value of Army inventory	Value of Navy inventory <sup>b</sup>	Value of Air Force inventory
2009	\$89.9	\$22.4	\$21.7	\$28.2
2010	95.6	22.0	22.1	31.8
2011	98.9	21.4	23.0	32.4
2012	95.0	19.7	23.4	30.2
2013	98.1	17.7	24.2	36.5

Source: GAO analysis of DOD data. | GAO-15-350

Note: The Department of Defense (DOD) values inventory at latest acquisition cost, with reductions for reparable inventory in need of repair and salvage prices for potential reutilization/disposal stock (i.e., on-hand excess). These values are reported in DOD's annual Supply System Inventory Report.

<sup>a</sup>Total value for DOD includes inventories held by the services, including the Marine Corps, and the Defense Logistics Agency, which are not shown separately in the table.

<sup>b</sup>The Navy manages aviation spare parts for the Marine Corps' aviation weapon systems, such as helicopters and airplanes, and this inventory is included in the provided figures. However, the Marine Corps manages its own nonaviation spare parts, which are not included in the Navy figures.

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## DOD's Process for Categorizing Inventory to Determine On-Hand and On-Order Excess Inventory

DOD guidance requires the services to assess the ability of the inventory to meet the stated requirement and ensure that surplus inventories are kept only if warranted.<sup>18</sup> To help ensure consistency in the reporting of these data, the services are required, among other things, to stratify their inventories into several specific categories—according to the purpose for which they are held—and provide the results in an inventory stratification report to OSD at least twice a year.<sup>19</sup> The categorization is designed to provide visibility of DOD inventory requirements, assets (on-hand and on-order), demand, and overages or shortfalls.

As specified in DOD guidance, the key inventory categories include the approved acquisition objective and three categories that exceed the approved acquisition objective—economic retention stock, contingency retention stock, and potential reutilization stock:

- **Approved acquisition objective:** The quantity of an item authorized for peacetime and wartime requirements to equip and sustain U.S. and allied forces.<sup>20</sup> OSD also has instructed the services to report inventory managed by a contractor as part of the approved acquisition objective.

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<sup>18</sup>DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting*, and Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition* (Feb. 10, 2014).

<sup>19</sup>The amount of inventory in each category is based on a snapshot at a particular point in time and fluctuates in part due to changes in demand rates for individual items. The changes in demand affect the size of each category, thereby affecting the distribution of inventory across the categories on an item by item basis. For example, a specific item at one particular point in time may have stock categorized as economic retention stock, but several months later may not have any stock categorized as economic retention stock due to an increase in demand. Since there are fluctuations in the size of the categories on an item by item basis, there are also fluctuations in the aggregate as well. Moreover, \$1 billion in economic retention stock at one particular point of time cannot be assumed to comprise the same items at the same quantities as \$1 billion in economic retention stock at another point in time.

<sup>20</sup>In this report, we also refer to the approved acquisition objective as inventory necessary to meet requirements. The approved acquisition objective includes materiel to meet requirements, such as operating requirements, war reserves, and safety levels, plus 2 years of forecasted demand.

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- **Economic retention stock:** Materiel that has been calculated to be more economical to keep than to dispose of and repurchase because it will likely be needed in the future.
  - **Contingency retention stock:** Materiel retained to support specific contingencies, such as supporting foreign military sales, future military operations, disaster relief, or civil emergencies, or mitigating risk associated with diminished manufacturing sources or nonprocurable stock.
  - **Potential reutilization stock (i.e., on-hand excess inventory):** Items that have been identified for possible disposal, but have potential for reuse and are under review for transfer to Defense Logistics Agency Disposition Services.<sup>21</sup>

Additionally, the services track on-order excess inventory, which consists of items for which a contract has been awarded or funds have been obligated, but due to subsequent changes in requirements would be categorized upon delivery as economic retention stock, contingency retention stock, or potential reutilization stock.

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## Services' Information Technology Systems for Managing Inventory

Each of the services uses its own information technology system to manage inventory. The Army and Navy have transitioned to enterprise resource planning systems, which are modified commercial off-the-shelf software with multiple, integrated modules that perform a variety of business-related tasks, such as accounting; inventory forecasting, purchasing, management, and distribution; and scheduling work. The Army for several years has used the Logistics Modernization Program to manage its inventory,<sup>22</sup> while the Navy transitioned its inventory management to the Navy Enterprise Resource Planning system from

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<sup>21</sup>Defense Logistics Agency Disposition Services supports and coordinates the disposal of excess and surplus property within DOD. Property not reutilized within DOD is available for transfer to other federal agencies or for donation to authorized nonprofit organizations, state governments, and local governments. Property not reused, transferred, or donated is either sold to the public or disposed of.

<sup>22</sup>For our most recent report on the Army's Logistics Modernization Program, see GAO, *Defense Logistics: Army Should Track Financial Benefits Realized from Its Logistics Modernization Program*, [GAO-14-51](#) (Washington, D.C.: Nov. 13, 2013).

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2010 through 2012.<sup>23</sup> The Air Force canceled the development of its enterprise resource planning system in 2012, and uses its legacy information technology system (called D200) to manage inventory.<sup>24</sup>

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## The Services Have Reported Generally Meeting DOD's Goal for Reducing On-Hand Excess Inventory, but Reporting Issues Hinder Visibility of Progress

The services have reported generally meeting DOD's goal, but reporting issues hinder visibility of their progress in reducing on-hand excess inventory. DOD set a goal to reduce on-hand excess inventory to 10 percent of the value of total inventory by the end of fiscal year 2014 and to 8 percent by the end of fiscal year 2016 as part of the *Comprehensive Inventory Management Improvement Plan*.<sup>25</sup> The Army reported that it had not met the 10 percent goal, and the Army is miscalculating its inventory requirements, potentially resulting in the underreporting of its on-hand excess inventory. The Navy and Air Force reported meeting the 10 percent goal, but the inclusion of contractor-managed items in their calculations, which was done to comply with OSD instructions, overstated their performance in reducing on-hand excess inventory. In addition, the Army set an internal goal to reduce its total inventory without conducting an analysis of Army data to support setting the goal. Finally, the services reviewed their processes for determining inventory that is economical to retain (i.e., economic retention stock) for consistency with DOD guidance, and the Air Force found that it retained approximately \$2.6 billion of inventory that was not properly justified.

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<sup>23</sup>See GAO, *DOD Financial Management: Reported Status of Department of Defense's Enterprise Resource Planning Systems*, [GAO-12-565R](#) (Washington, D.C.: Mar. 30, 2012), for additional information on the Army's Logistics Modernization Program and the Navy Enterprise Resource Planning system.

<sup>24</sup>For additional information about the cancellation of the Air Force's enterprise resource planning system, see United States Senate Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs, *The Air Force's Expeditionary Combat Support System (ECSS): A Cautionary Tale on the Need for Business Process Reengineering and Complying with Acquisition Best Practices* (July 7, 2014), and GAO, *Major Automated Information Systems: Selected Defense Programs Need to Implement Key Acquisition Practices*, [GAO-13-311](#) (Washington, D.C.: Mar. 28, 2013). Additionally, [GAO-13-311](#) reports on the status of the Navy's implementation of its enterprise resource planning system.

<sup>25</sup>The department-wide percentage of on-hand excess inventory, as of the end of September each year, is reported to the DOD Deputy Chief Management Officer for inclusion in DOD's *Annual Performance Plan* as a key performance measure for logistics and acquisition. DOD also has included the department-wide percentage of on-hand excess inventory as a key measure in the department's *Strategic Management Plan* for fiscal years 2014-2015. See app. I for an overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

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## The Army Is Miscalculating Its Inventory Requirements, Resulting in the Underreporting of the Combined Amount of Retention and On-Hand Excess Inventory

As of March 2014, the Army reported that its on-hand excess inventory was 12.4 percent, or about \$2.5 billion, of its roughly \$20 billion in on-hand inventory; however, an inaccuracy in the Army's reporting means that its combined amount of retention and on-hand excess inventory has been underreported. OSD requires the services and the Defense Logistics Agency to report progress in meeting their inventory management goals.<sup>26</sup> When calculating the amount of inventory necessary to meet requirements (i.e., the approved acquisition objective), which is necessary to determine the amount of retention stock and on-hand excess inventory, the Army included 3 years of estimated future demand in its end-of-fiscal-year inventory stratification reports for 2011 through 2013. Current Army guidance,<sup>27</sup> however, requires that 2 years of estimated future demand be used to determine inventory necessary to meet the approved acquisition objective in the end-of-fiscal-year inventory stratification reports, and that any amount held above the approved acquisition objective be identified as economic or contingency retention stock or as on-hand excess inventory. Army Materiel Command officials stated that the extra year of demand was included because that was in accordance with the OSD guidance at the time their enterprise resource planning system was designed in the late 1990s.

Because the Army included an additional year of demand when calculating the amount of inventory necessary to meet the approved acquisition objective, it underreported the combined amount of its retention stock and excess inventory. Specifically, we found that, as a result of including a 3rd year of estimated future demand in its approved acquisition objective, the combined retention and excess inventory reported by the Army was understated by approximately \$1.4 billion in both fiscal years 2011 and 2012 and by \$1.7 billion in fiscal year 2013. In other words, inventory that was incorrectly placed into the approved acquisition objective should have been instead categorized as economic retention, contingency retention, or on-hand excess inventory. However, Army officials were unable to determine how the inventory included to meet a 3rd year of estimated demand should have been categorized (i.e.,

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<sup>26</sup>OSD uses the March 31 and September 30 inventory stratification reports to monitor the Defense Logistics Agency's and the services' progress towards achieving the on-hand excess inventory reduction goal.

<sup>27</sup>Army Regulation 710-1, *Inventory Management: Centralized Inventory Management of the Army Supply System* (Sept. 20, 2007).

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as economic or contingency retention stock or as on-hand excess inventory) had these items not been included as part of the approved acquisition objective. Furthermore, we also were unable to determine to what extent these items would have been categorized as economic retention stock, contingency retention stock, or on-hand excess inventory based on our analysis of this additional inventory. According to Army officials, they have been aware of some discrepancies between their enterprise resource planning system, which is used for day-to-day execution of inventory planning, and stratification reports since late 2011.<sup>28</sup> However, Army officials were unaware that the use of 3 years of demand data was not consistent with its guidance until we brought it to the Army's attention during the course of our review. In its latest report to OSD in September 2014, the Army disclosed that its approved acquisition objective included 3 years of demand data.

As of January 2015, the Army is working to revise its inventory stratification reporting process through the development of a Supply Chain Planning Reporting Tool. Officials said that this tool will more closely align their day-to-day inventory execution actions (i.e., procuring spare parts and managing on-order and on-hand inventory), stratification reporting as required by DOD guidance, and budget formulation for spare parts. Officials added that the tool will provide a more accurate determination of the approved acquisition objective, retention stock, and the amount of excess inventory. As part of the revised process, officials said that 2 years rather than 3 years of demand data will be used to determine the amount of inventory necessary to meet the approved acquisition objective. However, the Army has not finalized a timeline and implementation plan for developing the tool to correct its calculation, though officials stated that they hoped to have it completed by May 2016. Furthermore, according to Army officials, it is not clear whether an interim solution—which the Army planned to build using elements of the tool—will be implemented in the meantime, which means the Army will continue using 3 years of demand data. Therefore, the Army will not be in a position to accurately report its inventory for 2015 and potentially 2016 if it encounters delays implementing the tool. By using 3 years of demand data rather than the 2 years required by Army policy, the Army will likely continue to overstate its performance in meeting DOD's goal for reducing on-hand excess inventory. This information is critical to managing and

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<sup>28</sup>Specifically, the Army noted large differences between future purchases and procurement reschedule recommendations.

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overseeing the department's progress in implementing the *Comprehensive Inventory Management Improvement Plan*.

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**The Navy and Air Force Report Meeting DOD's Goal, but the Inclusion of Contractor-Managed Inventory Hinders Accurate Reporting of Progress**

Both the Navy and Air Force report meeting DOD's on-hand excess goal as of March 2014; however, the percentage of on-hand excess inventory for both services has been understated due to the inclusion of contractor-managed inventory in their total inventory at the instruction of OSD. Specifically, when calculating the percentage of on-hand excess inventory, both the Navy and the Air Force, at the direction of OSD, included all of the known amounts of contractor-managed spare parts in the value of total inventory. However, the amount of excess inventory only included the value of excess spare parts managed by the services themselves. Calculating the percentage of on-hand excess inventory in this manner understates the percentage of excess inventory that is managed by the services. While this calculation did not affect the ultimate determination of whether the services had met DOD's on-hand excess inventory goal as of March 2014, determining whether the services meet the goals in future assessments could depend on whether on-hand excess inventory is being accurately reported.

At the end of fiscal year 2012, the Navy reported 10.7 percent in on-hand excess inventory, slightly more than DOD's fiscal year 2014 goal of 10 percent. It reported that it had achieved DOD's goal in September 2013, and has continued to make reductions. More specifically, the Navy reported it reduced the total amount of its excess inventory from \$3.0 billion in 2012 to a low of \$1.4 billion by March 2014.<sup>29</sup> Navy officials attributed the reduction in on-hand excess inventory from September 2012 through March 2014 to its improved use of and confidence in the

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<sup>29</sup>Due to the Navy's reporting cycle, the most recent data included in this report are from March 2014.

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Navy Enterprise Resource Planning system,<sup>30</sup> which is used to execute its semiannual disposal process.<sup>31</sup>

The Air Force has reported similarly meeting DOD's 10 percent goal for on-hand excess inventory. It reported levels of on-hand excess that fluctuated between 3.6 and 7.7 percent—representing between \$1.3 billion and \$2.7 billion—of its total on-hand inventory from fiscal years 2010 through 2013. This included a reduction from the end of fiscal year 2010 through the end of fiscal year 2012; though the percentage and amount of on-hand excess inventory increased in fiscal year 2013, it remained below the DOD goal. The Air Force attributed the overall reductions in its on-hand excess inventory to a variety of actions including reviewing items that have had no demand for 10 years or more and verifying the extent that inventory disposals should continue to be deferred on items that are projected to have 30 years or more worth of inventory on-hand.<sup>32</sup> Air Force officials added that the fiscal year 2013 increase to their on-hand excess inventory was a result of sequestration and delays in removing inventory targeted for disposal from the Air Force's records and onto the records of the Defense Logistics Agency.<sup>33</sup>

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<sup>30</sup>The Navy implemented its enterprise resource planning system from 2010 through 2012, but officials told us that the Navy continues to learn how to effectively use the system to further improve inventory management.

<sup>31</sup>As a part of the semiannual disposal process, Navy supply planners identify on-hand excess inventory in collaboration with key stakeholders (e.g., weapon system program offices) by reviewing the requirements and implementing DOD policy for retaining economic and contingency retention stock. Specifically, Naval Supply Systems Command identifies all inventories that are not necessary to meet inventory requirements (i.e., the approved acquisition objective) and will not be retained as economic retention stock. This inventory is then evaluated to determine whether it should be retained as contingency retention stock and the inventory that is not retained as contingency retention stock is then disposed of. To enhance its process of determining inventory to retain as contingency retention stock, during the summer of 2013, Naval Supply Systems Command developed a collaboration website that stakeholders outside of Naval Supply Systems Command can use to identify all of the items that are candidates for disposal and provide input to the disposal decisions by the supply planner.

<sup>32</sup>We provide more details on various Air Force inventory management improvement initiatives that contributed to these reductions in app. III.

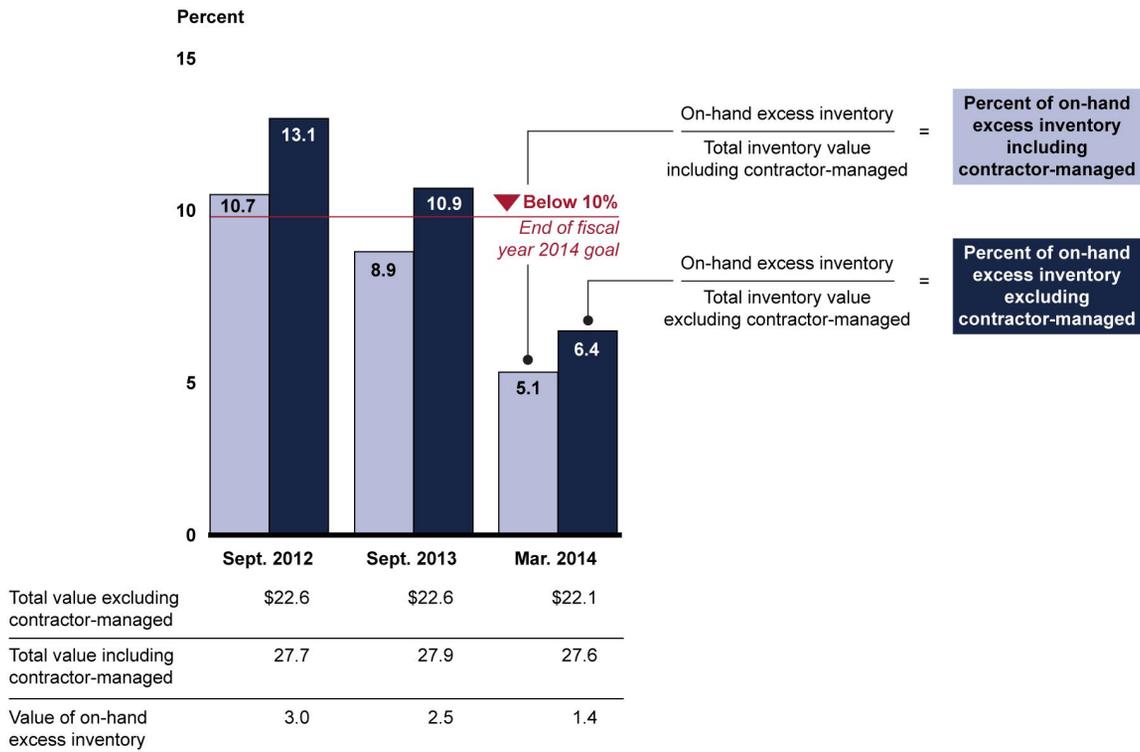
<sup>33</sup>Sequestration is the process of presidentially directed, largely across-the-board spending reductions, under which budget authority is reduced to enforce certain budget policy goals. The Budget Control Act of 2011 (Pub. L. No. 112-25 [2011], as amended), as implemented by the Office of Management and Budget, required spending cuts of \$37 billion from DOD's budget in fiscal year 2013. We are currently reviewing the effects of the fiscal year 2013 sequestration on DOD and expect to issue a report in May 2015.

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According to Air Force officials, Air Force flying hours were reduced due to sequestration with consequent effects on Air Force on-hand excess inventory. Specifically, Air Force spare part requirements are driven in large part by projected flying hours, and when the flying hours were reduced, the spare part requirements were also reduced, which resulted in higher levels of on-hand excess inventory.

Though these on-hand excess inventory numbers were reported by the Navy and Air Force, our analysis shows that the services' actual percentage of on-hand excess inventory were, in both cases, higher than the reported value because of the inclusion of contractor-managed inventory in the on-hand excess inventory calculation. For example, our analysis of Navy inventory data, as shown in figure 1, shows that when contractor-managed spare parts are excluded from the calculation, the results indicate that the Navy did not meet DOD's on-hand excess inventory goal in September 2013, whereas inclusion of these parts indicates that the Navy met the goal. From September 2012 through March 2014, the inclusion of contractor-managed spare parts results in an understatement of on-hand excess inventory for Navy-managed inventory ranging from 1.3 percent to 2.4 percent.

**Figure 1: Navy On-Hand Excess Inventory, 2012–2014 (Nominal Dollars in Billions)**

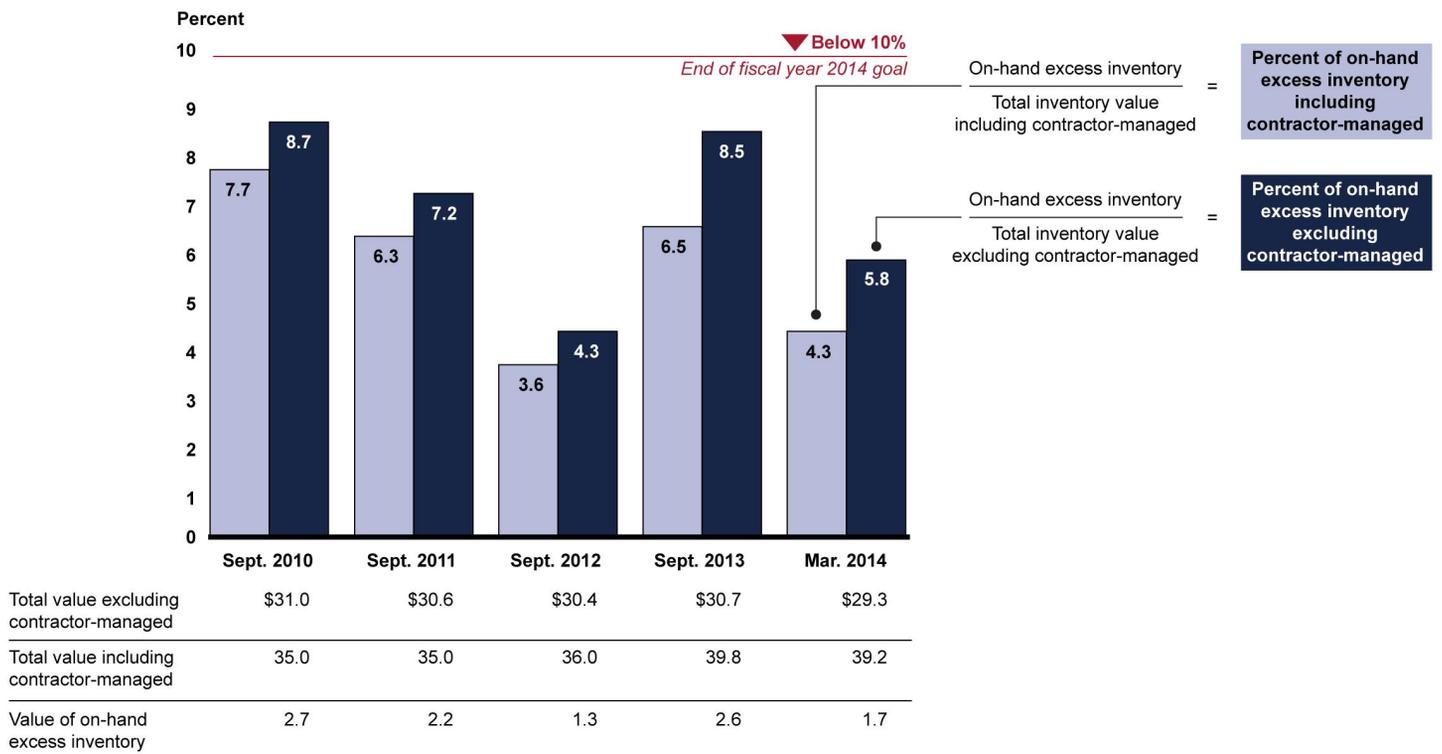


Source: GAO analysis of Navy inventory data. | GAO-15-350

Note: The Navy was implementing the Navy Enterprise Resource Planning system during 2010 and 2011, and complete data were not available during these fiscal years. Percentages may not total correctly due to the rounding of the dollar values.

Furthermore, our analysis determined, as shown in figure 2, that although the Air Force reported on-hand excess inventory ranging from 3.6 percent to 7.7 percent from fiscal years 2010 through 2013, it would have reported excess inventory ranging from 4.3 percent to 8.7 percent if contractor-managed inventory had been excluded.

**Figure 2: Air Force On-Hand Excess Inventory, 2010–2014 (Nominal Dollars in Billions)**



Source: GAO analysis of Air Force inventory data. | GAO-15-350

DOD guidance states that inventory stratification reports should be used to improve decision making on holding inventory, and provide visibility of DOD’s inventory requirements, assets, demand, and overages or shortfalls.<sup>34</sup> Navy and Air Force officials included contractor-managed parts in their on-hand excess calculations because OSD had instructed the services to include this type of inventory in an effort to standardize the calculation across the services and the Defense Logistics Agency. An OSD official stated that the services reported this inventory to satisfy Financial Improvement and Audit Readiness reporting requirements that

<sup>34</sup>DOD Manual 4140.01, Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition*, and DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting*.

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are aimed at ensuring the services accurately report their assets. The Army also included contractor-managed parts in the value of its on-hand excess inventory calculation, but did not follow OSD instructions like the Navy and Air Force. Army officials stated that they prorated the contractor-managed parts using the same ratio as the service-managed parts, which did not alter the percentages calculated for on-hand excess inventory of Army-managed items.<sup>35</sup>

DOD's and the services' efforts to capture and report the amount of contractor-managed inventory are important to providing visibility over all inventory. As a part of this effort, in the fall of 2014 OSD began reevaluating how the department should report contractor-managed inventory and the types of information, such as the amount of excess inventory, contractors should be required to report to the department. As of January 2015, OSD was in the process of drafting guidance on this issue, which is scheduled to be issued by the end of 2015. OSD officials agree that the revised policy, once issued, will take years to be implemented because the reporting requirements for contractor-managed inventory will need to be added to the contracts between commercial vendors and the government over time as contracts are renegotiated or executed. However, this draft guidance does not address whether contractor-managed inventory will or will not be included in the calculation of the on-hand excess inventory metric, which is used to assess the department's progress.

The department's current calculation, which includes contractor-managed items, of its on-hand excess inventory metric results in an inaccurate measure of progress. Specifically, the current calculations result in the appearance that the Navy and Air Force made greater progress in reducing their percentage of on-hand excess inventory than they actually did. Furthermore, the same result would have occurred for the Army if it had followed OSD's instruction to include contractor-managed inventory. As a result, the inclusion of contractor-managed inventory in calculations of the percentage of on-hand excess inventory reduces the accuracy of

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<sup>35</sup>For example, if the Army had 75 percent of its inventory stratified as the approved acquisition objective, 15 percent as economic retention stock, 2 percent as contingency retention stock, and 8 percent as on-hand excess inventory, the contractor-managed inventory would be assumed to stratify in the same proportions in each category. By including contractor-managed inventory in this manner, the percentage of on-hand excess inventory remains at 8 percent. The Navy had previously prorated its contractor inventory in a similar manner, but stopped doing so in order to comply with OSD instructions.

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the information available to the department and Congress as they monitor the services' progress in reducing the percentage of on-hand excess inventory they manage.

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### The Army's Inventory Reduction Goal Was Not Supported by an Analysis of Army Data

In March 2013, the Army set an internal goal to reduce its total on-hand inventory, but this goal was not developed using an analysis of Army data. Specifically, the Army set a goal of reducing its total on-hand inventory from \$21.9 billion in March 2013 to \$17.1 billion, a net reduction of 22 percent or \$4.8 billion, by the end of fiscal year 2014.<sup>36</sup> In pursuit of the inventory reduction goal, from March 2013 through September 2014, the Army disposed of over \$5.4 billion in on-hand inventory, which contributed to a net reduction of \$3.2 billion, or about 15 percent.<sup>37</sup> The Army fell short of reaching its reduction goal in part because it did not account for the amount of inventory returning from overseas operations when setting the goal, according to Army officials. For example, the Army received on-hand inventory valued at over \$9.6 billion from March 2013 through September 2014.

The Army's inventory reduction goal is much broader than DOD's inventory reduction goal, because it encompasses all on-hand inventory, not just on-hand excess inventory. One of the goals of DOD's *Comprehensive Inventory Management Improvement Plan* is to reduce on-hand excess inventory to 8 percent of the total value of on-hand inventory by fiscal year 2016. The Army, in contrast, is focused on reducing its total on-hand inventory level, regardless of whether the inventory is categorized as on-hand excess inventory, contingency retention stock, economic retention stock, or part of the approved acquisition objective.

However, the Army's goal was not developed with an analysis of Army's inventory data. Specifically, according to Army officials, the inventory reduction goal was developed after discussions with a consultant

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<sup>36</sup>In contrast to the Army, the Navy and Air Force chose not to establish internal goals for reducing total on-hand inventory, but rather allow their requirements for spare parts to determine appropriate inventory levels, including the inventory to be disposed of.

<sup>37</sup>The Army's inventory is not static; the levels of inventory for individual items and in aggregate change constantly. For example, the Army is simultaneously providing inventory to its military customers, ordering more stock to satisfy future requirements, and disposing of inventory no longer needed. Therefore, the disposal of \$5 billion in on-hand inventory does not translate into a \$5 billion net reduction in total on-hand inventory.

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implementing their new inventory management process, who had extensive experience with private-industry inventory management.<sup>38</sup> The Army officials and representatives for the consultant stated that private-sector organizations implementing a similar process reduced their on-hand inventory between 20 and 50 percent. The Army used this range to set its inventory reduction goal, but at the time did not conduct a formal analysis of its inventory data to inform the goal, such as identifying items that have had multiple years of no demand. Army officials stated that the reduction goal was intended to drive a transformation in Army inventory management, specifically ensuring that on-hand inventory was being held to meet requirements and disposing of unneeded excess inventory, rather than focusing only on inventory identified as excess in the stratification process. Additionally, the Army conducted two studies after March 2013 to identify potential inventory for disposal; however, this effort was not performed to develop the inventory reduction goal, but rather conducted after the goal was established to assist the life-cycle commands in achieving the goal.

Furthermore, when the Army established its goal in March 2013, the reduction required to meet the goal exceeded the amount of on-hand inventory the Army had reported as excess by approximately \$3.0 billion. Therefore, the Army could not achieve its inventory reduction goal without disposing of items that were being held as economic or contingency retention stock at the time.<sup>39</sup> Army officials emphasized that an item that was identified as a disposal candidate was reviewed, in accordance with Army guidance, to prevent the disposal of inventory that should be retained.<sup>40</sup> However, Army officials also noted that the reason the goal was higher than the official amount of on-hand excess inventory was that

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<sup>38</sup>This new process, called Sales and Operations Planning, is discussed in app. III.

<sup>39</sup>In our June 2014 review of the Defense Logistics Agency's inventory management practices, we found that it had disposed of \$855 million in inventory that was more economical to retain while attempting to meet a similar internal inventory reduction goal. DOD concurred with our recommendation to reassess and revise, if appropriate, its on-hand inventory-reduction goals and schedule to achieve them in a way that minimizes risks and costs of having to buy items again in the long term. Subsequently, in July 2014 the Defense Logistics Agency reassessed and adjusted its on-hand inventory reduction goal for the end of fiscal years 2014 and 2015.

<sup>40</sup>Specifically, Army Regulation 710-1, *Centralized Inventory Management of the Army Supply System*, requires item managers to screen potential disposal items against all retention levels, security assistance requirements, and the potential usefulness of the item.

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the stratification reports, which are designed in part to help identify excess inventory, did not accurately capture all Army inventory that was not needed, such as the items later identified by the 2013 studies. In addition, as we previously discussed, incorrect calculation of the approved acquisition objective resulted in the combined amount of retention stock and on-hand excess inventory being understated.

*Standards for Internal Control in the Federal Government* and leading practices for results-oriented management emphasize the importance of reviewing and validating performance measures to ensure these measures are and remain appropriate.<sup>41</sup> As of January 2015, Army officials stated that they will continue to have an on-hand inventory reduction goal, although they were uncertain whether they would continue to target a 22 percent reduction and, if necessary, how they would determine a new target. Without reassessing and revising its on-hand inventory reduction goal, as necessary, based on analysis of reliable Army inventory stratification data and other relevant inventory factors, such as inventory returning from overseas operations, the Army will continue to pursue a goal it may be unable to achieve without disposing of inventory that it should retain.

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### The Services Reviewed Economic Retention Processes for Consistency with DOD Guidance, and the Air Force Retains Some Items without Proper Justification

The services each reviewed their economic retention processes for consistency with DOD guidance, and while the Army and Navy found theirs to be consistent, the Air Force found that it retained approximately \$2.6 billion of inventory that was not properly justified. The Air Force recognizes that its economic retention methodology is not consistent with DOD's guidance and is working to improve its retention process, but it has not started formal reviews to determine whether these items should be recategorized and retained as contingency retention stock or disposed of as excess. According to DOD guidance, the services should ensure that inventory not needed to meet peacetime and wartime requirements is retained if (1) it is more economical to retain than dispose of and risk rebuying in the future (economic retention stock) or (2) the items can be used during specific contingencies (contingency retention stock).<sup>42</sup> Further, this guidance identifies numerous criteria that must be met by the

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<sup>41</sup>See [GAO/AIMD-00-21.3.1](#) and [GAO-05-927](#).

<sup>42</sup>DOD Manual 4140.01, Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition*.

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services in determining whether inventory can be held as economic retention stock. One of the criteria is whether an item has a reasonably predictable demand rate that can be used in determining how much inventory should be retained as economic retention stock.<sup>43</sup>

The Army and Navy analyzed their respective methodologies for determining the amount of economic retention stock in 2014 and 2013 respectively, and each determined that its methodology met the criteria in DOD guidance, including only retaining items with a predictable demand rate. For example, the Army considers an item for economic retention only if it has a predictable rate of demand based on the frequency and month-to-month variation of its demands. The Navy's methodology considers factors such as storage costs, disposal value, and simulated repair and procurement actions based on demands over an item's life cycle.<sup>44</sup> As a result of the Navy's analysis in its 2013 review, officials stated that they are taking steps to improve and refine how it identifies economic retention stock, such as increasing the number of years of demand for particular phases of an item's life cycle that are used to calculate the amount of economic retention stock.

In contrast to the Army and Navy, the Air Force's economic retention methodology allows items that do not have a predictable rate of demand to be held as economic retention stock, which is not in accordance with DOD guidance. As a part of activities associated with the implementation of the *Comprehensive Inventory Management Improvement Plan*, in September 2011, the Air Force first identified that its factors for determining levels of economic retention stock were not economically based. In September 2014, OSD and the Air Force determined that 96 percent of the items the Air Force reported as economic retention stock were not economical to retain (using data as of the end of March 2014). Air Force officials estimate that these items account for approximately \$2.6 billion of the \$3.2 billion the Air Force reported as economic retention

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<sup>43</sup>In some instances, a part can be retained as economic retention stock because of an expectation of a probable (as opposed to predictable) demand. If the justification is a probable demand, the inventory item may be considered for retention as economic retention stock, provided the service or the Defense Logistics Agency has a documented rationale that economically justifies retention and that rationale is available for audit purposes.

<sup>44</sup>An item can progress through six different phases over the course of its life cycle ranging from initial operational capability to retirement.

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stock and should not have been categorized as economic retention stock because they do not have predictable rates of demand and therefore should not be considered for economic retention. Air Force officials said they expect most of this \$2.6 billion inventory will be recategorized as contingency retention stock, and the remainder will be disposed of as excess inventory. However, until each item is reviewed using the DOD criteria for contingency retention stock, Air Force officials stated that they will not know exactly how much of the inventory is excess and should be disposed of.

At least once a year, the Air Force performs a contingency retention review on all stock that stratifies above economic retention stock to determine whether these items should be deferred from disposal and retained as contingency retention stock.<sup>45</sup> According to Air Force officials, formal reviews of the \$2.6 billion in inventory identified as not meeting the criteria to be retained as economic retention stock will not begin until the second half of fiscal year 2016 at the earliest. The Air Force wants to first revise its economic retention methodology before evaluating this inventory for retention as contingency retention stock. However, the revised methodology and the incorporation of this methodology into its information technology system have not been approved or funded. Therefore, the Air Force plans to retain and store this \$2.6 billion in inventory that it has already determined to not be economic retention stock until these changes have been incorporated into its information technology system. According to Air Force officials, the Air Force could feasibly review and determine whether this inventory should be retained as contingency retention stock.

Without beginning an assessment of this \$2.6 billion in inventory in the interim to determine the items and amounts that should be retained as contingency retention stock, the Air Force risks continuing to incur storage costs for unneeded inventory during 2015, 2016, and potentially longer. Storing unneeded inventory diverts resources from other priorities within the Air Force or across the department. Our analysis was unable to determine an exact estimate of the storage costs for these items for several reasons, but the storage costs could potentially run into several

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<sup>45</sup>All items that are retained as contingency retention stock must be approved by an official at one or several levels in the Air Force depending upon the item's total value of inventory in stock.

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million dollars a year.<sup>46</sup> For example, in fiscal year 2013, the Air Force held about \$31 billion in inventory and incurred about \$48 million in storage costs. Thus, assuming a pro-rated basis, \$2.6 billion in inventory would cost approximately \$4 million to store for a year. In addition, until the approximately \$2.6 billion of inventory is reviewed, analyzed, and recategorized as appropriate, the Air Force cannot accurately report the amount of its contingency retention stock and excess inventory, hindering OSD's oversight and obscuring the Air Force's progress on achieving DOD goals.

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## Services Have Had Mixed Success at Meeting DOD's Goal for Reducing On-Order Excess Inventory, and the Army and Navy Processes Have Management Weaknesses

The Army and Navy have reported not meeting DOD's goal for reducing on-order excess inventory, while the Air Force generally has met the goal. The Army and Navy have weaknesses in their management processes that pose challenges to DOD achieving its reduction goal. Specifically, Army Materiel Command management has not established goals for each of its life-cycle management commands for reducing on-order excess inventory. The Navy is taking steps to reduce on-order excess inventory, but weaknesses remain that limit the Navy's visibility of its on-order excess inventory. Lastly, the Air Force regularly reviews on-order excess inventory, including using graduated levels of review based on dollar thresholds and tracking the reasons for not canceling or modifying on-order excess inventory.

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<sup>46</sup>First, the Air Force does not know which items will be retained versus disposed of since its analysis has not been completed. Second, storage costs are determined based on the amount of cubic feet required to store a particular item and the number of those items in storage. Third, the rates per cubic foot are based on the manner (e.g., covered or uncovered) in which a particular item is stored.

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The Army and Navy Have Reported Not Meeting DOD's Goal, but the Air Force Generally Has Reported Meeting It

The Army and Navy have reported not meeting DOD's goal for reducing on-order excess inventory, while the Air Force has reported generally meeting the goal. Through the *Comprehensive Inventory Management Improvement Plan*, DOD established a goal of reducing the percentage of on-order excess inventory to 6 percent of the total value of on-order inventory by the end of fiscal year 2014 and 4 percent by the end of fiscal year 2016.<sup>47</sup> Additionally, DOD established targets for the intermediate years to track its progress reducing on-order excess inventory.<sup>48</sup> OSD uses inventory data from March and September of each year to review the services' on-order excess inventory performance against the goal. In 2014, OSD began reviewing how the amount of on-order excess inventory would be distributed among the categories above the approved acquisition objective as well. According to OSD officials, this more detailed review of on-order excess inventory provides better visibility and understanding of this inventory. As discussed in our prior body of work and emphasized in the *Comprehensive Inventory Management Improvement Plan*, the management of on-order excess is an important part of inventory management as a whole because it represents an opportunity to prevent the accumulation of excess inventory.<sup>49</sup> Due to the nature of inventory management, there are a number of factors that might lead to an item becoming on-order excess: incorrect forecasts, changes in military operations resulting in lower spare-part requirements, or lower-than-anticipated demands for an item. Proactively reviewing on-order excess inventory offers the services an opportunity to avoid the accumulation of inventory for which there is no established need.

The services' performance reducing on-order excess inventory and meeting DOD's goal has varied, as shown in table 2. See appendix IV for the services' total value of on-order inventory and on-order excess inventory.

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<sup>47</sup>See app. I for an overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

<sup>48</sup>The department-wide percentage of on-order excess inventory, as of the end of September each year, is reported to the DOD Deputy Chief Management Officer to be included in DOD's *Annual Performance Plan* as a key performance measure for logistics and acquisition. DOD also has included the department-wide percentage of on-hand excess inventory as a key measure in the department's *Strategic Management Plan* for fiscal years 2014-2015.

<sup>49</sup>See [GAO-14-495](#) and [GAO-12-493](#).

**Table 2: Army, Navy, and Air Force On-Order Excess Inventory Percentages, 2010–2014**

Service	Sept. 2010	Sept. 2011	Sept. 2012	Sept. 2013	Mar. 2014
Army <sup>a</sup>	10.4%	5.2%	7.9%	12.3%	18.3%
Navy	— <sup>b</sup>	— <sup>b</sup>	— <sup>c</sup>	— <sup>c</sup>	10.3
Air Force	4.5	5.5	4.6	9.1	6.7
DOD intermediate targets <sup>d</sup>	— <sup>e</sup>	7.0	6.6	6.3	6.3

Source: GAO analysis of Department of Defense (DOD) data. | GAO-15-350

<sup>a</sup>The Army percentages are those that it reported, but these percentages are likely underreported due to the Army overstating its approved acquisition objective as previously discussed, which results in the amount of the on-order excess inventory likely being understated.

<sup>b</sup>The Navy was implementing the Navy Enterprise Resource Planning system during 2010–2011, and complete data were not available during these fiscal years.

<sup>c</sup>The Navy could not extract reliable and accurate on-order excess inventory amounts and percentages due to complications associated with the implementation of its enterprise resource planning system in 2012 and 2013.

<sup>d</sup>DOD set intermediate targets for achieving its goal for decreasing the percentage of on-order excess inventory to 6 percent by the end of fiscal year 2014 and 4 percent by the end of fiscal year 2016.

<sup>e</sup>DOD did not set a goal for on-order excess inventory until the *Comprehensive Inventory Management Improvement Plan* was released in November 2010; thus, there was no goal set for fiscal year 2010, which ended September 2010.

The services' performance has varied, as explained below:

- Army:** The Army reports that it is not meeting DOD's goal for on-order excess inventory, and its percentage of on-order excess inventory has increased from about 5 percent at the end of fiscal year 2011 to over 18 percent as of March 2014. However, the dollar value of the Army's reported on-order excess inventory has decreased from \$255 million at the end of fiscal year 2012 to \$236 million in March 2014. Army officials noted that the amount of total inventory on order decreased from \$3.2 billion at the end of fiscal year 2012 to about \$1.3 billion in March 2014, which led to a sharp increase in the percentage of on-order excess inventory. However, as discussed previously, the Army's reporting of its approved acquisition objective has been overstated, which results in the amount of the on-order excess inventory likely being understated. As a result, the Army's progress toward meeting DOD's on-order excess reduction goal remains unclear.
- Navy:** The Navy has reported not meeting DOD's goal and did not report an accurate on-order excess amount until March 2014 due to issues encountered during the implementation of its enterprise resource planning system. The Navy's challenges in determining on-order excess inventory amounts are associated with the development and implementation of a tool within its enterprise resource planning

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system that calculates the amount of on-order excess inventory in March and September of each year.<sup>50</sup> Specifically for fiscal year 2013, Navy officials stated that computer coding defects resulted in overstated on-order excess inventory values, particularly at the end of the fiscal year. In order to meet DOD reporting requirements, the Navy worked around this error by extrapolating the amount and percentage of on-order excess inventory for its September 2012, March 2013, and September 2013 reports by applying historical average percentages of on-order excess inventory from its legacy system to its current amount of total on-order inventory. OSD officials are aware of the issues with the Navy's system and the Navy's workaround method for calculating on-order excess inventory. The Navy began using data in its enterprise resource planning system to report on-order excess inventory for the March 2014 reporting cycle. In addition, the Navy implemented a patch to fix the coding defect in June 2014 that affected the end of the fiscal year calculation of on-order excess inventory. Officials tested the patch prior to the September 2014 reporting cycle and stated that the issue has been resolved. The results of the September 2014 reporting cycle will be available in March 2015.

- **Air Force:** The Air Force has reported generally meeting DOD's goal for reducing on-order excess inventory. Specifically, from the end of fiscal year 2010 through March 2014, Air Force on-order excess inventory ranged from 4.5 percent to 9.1 percent of the total value of Air Force on-order inventory, generally in line with DOD's goal. However, the level of on-order excess inventory at the end of fiscal year 2013 was 9.1 percent, whereas the DOD target for that year was no more than 6.3 percent. According to Air Force officials, their analysis concluded that sequestration-related budget cuts to aircraft flying hours in the last quarter of that year caused a large increase in

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<sup>50</sup>The Financial and Logistics Integrated Requirements Report produces the Navy's inventory stratification report, which stratifies inventory into categories in accordance with DOD policy, as previously described in this report.

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on-order excess inventory.<sup>51</sup> According to an Air Force Sustainment Center official, the Air Force restored some flying hours after calculations were completed for the end of fiscal year 2013 inventory stratification report. Air Force officials agreed that this could result in decreased on-order excess inventory in the future as additional flying hours would result in higher inventory requirements. The most recent available data, reported as of March 2014, show that the Air Force's on-order excess inventory had declined to 6.7 percent, not quite meeting DOD's goal of 6.3 percent.

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## The Army Does Not Have Goals Focusing on On-Order Excess Inventory

Although the Army's percentage of on-order excess inventory has increased consistently since fiscal year 2011, Army Materiel Command does not have goals focused on its reduction. Specifically, Army Materiel Command management has not established goals for each of its life-cycle management commands for reducing on-order excess inventory, although the Army has established life-cycle management command goals for other areas, such as inventory reduction and backorders.<sup>52</sup> According to Army headquarters and life-cycle management command officials, specific goals in these other inventory management areas have helped to focus improvement efforts and improve performance. However, according to officials, Army management did not establish on-order excess inventory goals for each life-cycle management command because this was not a management priority at the time given that the

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<sup>51</sup>According to Air Force officials, the key drivers of Air Force inventory requirements are flying hours, engine overhauls, and programmed depot maintenance. These key drivers are related in that when flying hours are reduced, the projected usage of spare parts in depot maintenance decreases, reducing requirements for spare parts to be kept on hand and likely increasing on-order excess inventory levels. According to an Air Force official, the key connection between sequestration and on-order excess inventory is captured in the way that the Air Force's D200 inventory system determines requirements. The system calculates requirements for future repairs and replacements based upon expectations of future breakdown and failure of parts due to usage. These expectations of usage are, in turn, tied to the anticipated number of flying hours. An unanticipated drop in projected flying hours can lead to a decrease in requirements for parts and an increase in on-order excess inventory. As such, sequestration was responsible for creating additional on-order excess inventory because when the amount of forecasted flying hours were reduced, this automatically caused D200 to reduce the requirements for secondary inventory parts going forward, resulting in an increase to the amount of on-order excess inventory.

<sup>52</sup>In our June 2014 review of the Defense Logistics Agency's inventory management practices, we found a lack of supply chain-specific on-order excess inventory goals at the Defense Logistics Agency and recommended that it establish supply chain goals. DOD concurred with this recommendation and the Defense Logistics Agency established these goals in July 2014. See [GAO-14-495](#) for additional information.

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Army Materiel Command was not reviewing on-order excess inventory during its regular inventory management meetings. Standards for Internal Control in the Federal Government<sup>53</sup> and leading practices of federal agencies for results-oriented management<sup>54</sup> emphasize the importance of monitoring performance measures and progress achieving goals at the functional or activity level and linking the goals of component organizations to departmental strategic goals.

While Army management has not established on-order excess inventory reduction goals for its life-cycle management commands, Army item managers review on-order excess inventory monthly and quarterly to limit the accumulation of on-order excess. For example, the Army's enterprise resource planning system conducts a monthly automated assessment of incoming inventory to identify potential on-order excess inventory, which it flags for further item manager review. According to Army officials, the item manager then reviews the item to determine whether it should be modified or canceled.<sup>55</sup> The Army also has a separate quarterly review process to identify on-order excess inventory. Specifically, after each quarterly inventory stratification report is run, the Army will compare the inventory it has on order to the inventory that has stratified as potential reutilization stock, or excess. If the Army notes that inventory on order will come in as potential reutilization stock, it will flag the item for a particular level of review depending upon the dollar value of the order (i.e., graduated level of review). While the Army has had this review process in place since 2010, according to officials, the Army's overall level of on-order excess has continued to climb since September 2011.

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<sup>53</sup>[GAO/AIMD-00-21.3.1](#) .

<sup>54</sup>GAO, *Managing For Results: Data-Driven Performance Reviews Show Promise But Agencies Should Explore How to Involve Other Relevant Agencies*, [GAO-13-228](#) (Washington, D.C.: Feb. 27, 2013); [GAO-05-927](#); and *Agency Performance Plans: Examples of Practices That Can Improve Usefulness to Decisionmakers*, [GAO/GGD/AIMD-99-69](#) (Washington, D.C.: Feb. 26, 1999).

<sup>55</sup>In some cases, it does not make sense for financial reasons to modify or cancel a contract, even if the item will be excess. The item manager may be aware of other incoming demands—such as foreign military sales or new repair programs—that are not reflected in the enterprise resource planning system. If the item manager determines that a modification or cancellation is not warranted, the item manager develops a justification for and provides the justification code to the respective life-cycle management command.

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Since March 2013, Army senior managers have reviewed the Army's on-order excess inventory twice a year, through its Inventory Management Reviews held with OSD officials in support of the implementation of the *Comprehensive Inventory Management Improvement Plan*. However, the Army's two monthly senior management inventory meetings, which according to officials are used to monitor progress and make management decisions, do not regularly include discussions of on-order excess inventory.<sup>56</sup> According to Army officials, on-order excess inventory is not reviewed at these meetings because it is based on inventory stratification data, which they feel do not accurately reflect their current business processes. In addition, Army officials stated that the current senior management review meetings are intended to review the root causes of on-order excess inventory, such as inaccurate demand planning, which they expect ultimately to help address the overall levels of on-order excess. While these types of reviews are appropriate, OSD officials have emphasized that the on-order excess inventory reduction goal will continue to be a focus of the department's effort moving forward.

Since the Army has not established on-order excess inventory goals to guide improvement at the individual life-cycle management commands, the Army is not in the best position to maximize its reduction of on-order excess inventory. In addition, focusing on preventing on-order excess inventory can assist the Army in reducing on-hand excess inventory as well as preventing an increase in on-hand inventory levels, both of which are key goals at the Army and OSD. Without strengthening its management of on-order excess inventory by establishing and monitoring goals at the life-cycle management commands, the Army will not be positioned to invest in inventory that meets the needs of the service at the time of its procurement.

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<sup>56</sup>In our June 2014 review of the Defense Logistics Agency's inventory management practices, we found that its senior management was not reviewing key on-order excess inventory metrics and recommended that Defense Logistics Agency senior management regularly monitor progress reducing on-order excess inventory through its established performance briefings. DOD concurred with our recommendation and the Defense Logistics Agency's senior management, as of July 2014, began to regularly monitor progress reducing on-order excess inventory. See [GAO-14-495](#) for additional information.

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## The Navy Is Taking Steps to Reduce On-Order Excess Inventory, but Lacks a Required Management Review Process

The Navy is taking steps to reduce on-order excess inventory and meet DOD's goal, but it lacks a required management review process intended to prevent on-order excess inventory. Specifically, the Navy does not use graduated management reviews based on dollar thresholds to ensure that decisions to retain, rather than cancel or modify, on-order excess items are being approved at appropriate levels within the organization. In addition, the Navy currently does not have plans to incorporate this required management review process and the ability to track and review the reasons for not canceling or modifying on-order excess items into its automated termination module for on-order excess management that is under development. Naval Supply Systems Command uses DOD's on-order excess inventory goal to guide its efforts, and the goal is applicable to both its maritime and aviation supply chains. To achieve this goal, Naval Supply Systems Command, as a part of producing its semiannual inventory stratification report required by DOD guidance, conducts a manual review of on-order excess inventory, including reviewing top on-order excess items from each weapon system.

To improve its performance in reducing the percentage of on-order excess inventory, the Naval Supply Systems Command has taken four actions. First, Naval Supply Systems Command is focused on reducing the variance in on-order excess inventory performance between its aviation and maritime supply chains. Based on the March 2014 inventory data, the aviation supply chain's on-order excess inventory percentage was 6.1 percent while the maritime supply chain's percentage was 23.0 percent. According to Navy officials, a key reason for the difference in the performance between the two supply chains is that 67 percent of maritime supply planners have less than 2 years of experience and 51 percent have less than 1 year of experience. Additionally, the maritime supply chain was reorganized in October 2013. To improve management of on-order excess inventory within the maritime supply chain, Naval Supply Systems Command has taken several actions. For example, Naval Supply Systems Command provided additional personnel to assist in training maritime supply planners on on-order excess inventory reviews. Also, Naval Supply Systems Command Weapon Systems Support identified lessons learned from the aviation supply chain's processes to be applied to the maritime supply chain. For example, as a part of the manual review of on-order excess inventory, the maritime supply chain is focused on standardizing the timelines of the process and ensuring that management at every level reviews on-order excess inventory.

Second, Naval Supply Systems Command Weapon Systems Support implemented an additional review cycle in June 2014 that is intended to

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reduce on-order excess inventory by reviewing items in the preaward stage that have excess inventory. Naval Supply Systems Command Weapon Systems Support officials stated that they believe this review could assist in decreasing the amount of on-order excess inventory prior to the obligation of funds for spare parts because the cancellation or modification of items is much easier in the preaward stage before funds have been obligated. During the summer 2014 review, supply planners reviewed 1,126 items for preaward excess, resulting in order reductions or modifications valued at \$112.1 million. Additionally, during this review, supply planners reviewed 282 items with on-order excess inventory that would stratify as potential reutilization stock (i.e., on-hand excess inventory) upon delivery, resulting in reductions valued at \$74.3 million.

Third, Naval Supply Systems Command began tracking and reviewing the reasons for not canceling or modifying on-order excess items during its semiannual review process, which occurred from October 2014 through January 2015.<sup>57</sup> DOD guidance emphasizes the importance of documenting the reasons and decisions for retaining (i.e., not canceling or modifying) on-order excess items.<sup>58</sup> During our review, we identified that the Naval Supply Systems Command was not tracking and monitoring the reasons. In response, according to Navy officials, the Naval Supply Systems Command designed and implemented a web-based portal outside the Navy's enterprise resource planning system, to track and report the reasons for not canceling or modifying on-order excess items. Naval Supply Systems Command plans to continue to track and review this performance information as part of its inventory management processes, according to Navy officials.

Fourth, the Navy is in the early stages of developing an automated termination module within its enterprise resource planning system. Based on parameters that are under development, the termination module will periodically notify supply planners of items that have on-order excess

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<sup>57</sup>In our June 2014 review of the Defense Logistics Agency's inventory management practices, we found that it was establishing an automated report to track the amount of on-order excess inventory reviewed, modified, or canceled, and the reasons for not modifying or canceling. We recommended that the Defense Logistics Agency track and regularly review these performance data to improve its management of on-order excess inventory, and DOD concurred with our recommendation.

<sup>58</sup>DOD Manual 4140.01, Volume 3, *DOD Supply Chain Materiel Management Procedures: Materiel Sourcing*.

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inventory so they can take action such as modifying or canceling the procurement of the item, which would result in the item no longer having on-order excess inventory. However, initial testing of the Navy's termination module, as reported by the Navy in August 2014, revealed functionality issues, and Naval Supply Systems Command officials stated that no date has been established for implementing the termination module. According to Naval Supply Systems Command officials, the termination module is fairly low on the priority list given other higher priorities associated with the Navy Enterprise Resource Planning system, such as resolving other system defects affecting inventory management and financial compliance efforts associated with DOD's Financial Improvement and Audit Readiness plan.

While the Navy is taking steps to improve its management of on-order excess inventory, the Navy's termination process for on-order excess inventory does not use graduated management reviews based on dollar thresholds to ensure that decisions by supply planners to retain, rather than cancel or modify, on-order excess items are being approved at appropriate levels within the organization. Such a process is intended to ensure that senior managers have visibility of, and involvement in, retention decisions involving on-order excess inventory with higher dollar values, but the Navy's current practices do not include management reviews commensurate with the dollar value of the on-order excess item. DOD guidance requires that the management process for on-order excess inventory include graduated levels of review based on dollar thresholds for deciding when to reduce, cancel, or retain on-order excess assets.<sup>59</sup> This requirement is further emphasized in a November 2011 Naval Supply Systems Command memo to Naval Supply Systems Command Weapon Systems Support.<sup>60</sup>

Navy officials stated that they recognize the benefits of graduated management reviews, but as of January 2015, the Navy had not incorporated this process into its on-order excess inventory termination practices. According to Navy officials, the key focus over the last several years has been the implementation of its enterprise resource planning

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<sup>59</sup>DOD Manual 4140.01, Volume 3, *DOD Supply Chain Materiel Management Procedures: Materiel Sourcing*.

<sup>60</sup>Naval Supply Systems Command, *Management of Excess On-Order Assets* (November 2011).

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system to manage its inventory. Furthermore, design specifications for the system's termination module, which will be used to manage on-order excess items once implemented, do not incorporate graduated management reviews based on dollar thresholds or the ability to track and monitor the reasons for not canceling or modifying on-order excess items. As previously discussed, these are required to be part of the on-order excess inventory management process by DOD guidance, and would benefit the Navy by helping to ensure that on-order excess items were being retained only when necessary. Navy officials agreed that it would be beneficial to incorporate these features into the termination module for on-order excess items.

Without a graduated management review process based on dollar thresholds, Naval Supply Systems Command lacks oversight of on-order excess inventory termination decisions. Since the implementation of its automated termination module will not occur in the near term, strengthening its management of on-order excess inventory through its current processes, as it has done with respect to tracking and reviewing the reasons for not canceling or modifying on-order excess items, could better position the Navy to invest in inventory that meets the needs of the service at the time of its procurement. Moreover, without incorporating the graduated management reviews and the ability to track and review the reasons for not canceling and modifying on-order excess items into its termination module that is under development, the Navy would be missing an opportunity to automate processes that could improve the management of on-order excess items and reduce on-order excess inventory—a key goal of the Navy and OSD.

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### The Air Force Regularly Reviews and Collects Performance Data on On-Order Excess Inventory

The Air Force regularly reviews on-order excess inventory against DOD goals, including using graduated level reviews based on dollar thresholds to monitor the retention of on-order excess inventory and tracks the reasons for retaining on-order excess inventory. The Air Force uses DOD's on-order excess inventory goal to guide its efforts and regularly reviews its performance against these goals.<sup>61</sup> Specifically, the Air Force tracks on-order excess requirements through its D200 inventory management system, which provides quarterly data in accordance with

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<sup>61</sup>The components of the Air Force only contribute to meeting the Air Force's target in aggregate and do not seek to meet DOD's goals for each program, weapons system, or item.

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established Air Force guidance.<sup>62</sup> Both the Air Force Sustainment Center and its subordinate 448th Supply Chain Management Wing review performance reducing on-order excess inventory at least once a year.

Additionally, the D200 inventory system automatically calculates buy and repair requirements and termination quantities for on-order quantities in excess of requirements. Both inventory management specialists and materiel managers use the data as the basis of their decisions to buy or repair spare parts and for reviewing on-order inventory. For those items that are in excess of their requirements, D200 provides item managers and the members of their supervisory chain with information (through a graduated level based on dollar threshold) to act on so they can decide whether to cancel or modify this excess.<sup>63</sup> Additionally, the Air Force tracks the reasons for deciding to not cancel or modify an order for an item identified with on-order excess inventory. For example, the item manager with supervisor approval could decide not to cancel or modify an order because there was information that the inventory would be needed in the future, it was not economical to terminate the order, or there was a data error that resulted in the item being identified as having on-order excess inventory. The specific reason justifying a decision not to cancel or modify the order is documented on D200 reports.

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## Service Metrics Generally Balance Availability of Spare Parts and Supply Chain Costs

The services' inventory management metrics generally balance availability of spare parts with supply-chain costs, in accordance with DOD guidance, and the services use these metrics to assess overall inventory performance on a regular basis. DOD guidance requires the services to be responsive to customer requirements while balancing risk and costs, conduct periodic performance and cost evaluations, and adopt metrics that provide information on customer service, cost, and internal efficiency.<sup>64</sup> We determined a service's inventory management metrics to

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<sup>62</sup>Air Force Materiel Command Manual 23-1, *Requirements for Secondary Items (D200A, D200N)*, Incorporating Change 4 (Feb. 24, 2011).

<sup>63</sup>According to Air Force officials, any inventory determined to be more economical to keep is not considered excess for Air Force on-order excess item management, but instead is part of the required inventory.

<sup>64</sup>DOD Instruction 4140.01, *DOD Supply Chain Materiel Management Policy*, and DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting*.

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be balanced if they included metrics from each of these three areas—customer service, cost, and internal efficiency. Our review found that the services' metrics are generally balanced and regularly monitored, although there were variations among the services.

As we concluded in June 2014, a balanced approach across these key areas is important because without it any given metric could be optimized at the expense of other metrics.<sup>65</sup> For example, a supply chain could achieve a high level of customer service if it was less focused on the costs of purchasing excess materiel and storing it. Alternatively, a supply chain could reduce its costs if it was less focused on the resulting effect on parts availability and readiness. Delays in customer service can also affect readiness. For example, if a customer does not have a needed part, then this could affect the availability of a weapon system or the efficient functioning of a military repair depot. Finally, a supply chain could place too great an emphasis on internal efficiency—for example, pursuing a high forecast accuracy—but would risk increased costs due to repeatedly revising contracts to match changes in anticipated demands.

The services' metrics address a wide spectrum of service operations and balance a number of inventory areas, including the key areas of customer service, cost, and internal efficiency. Customer-service metrics generally measure the availability of parts or the number of backorders. Cost metrics measure financial aspects of inventory management, such as sales, obligations, as well as the cost-efficiency of operations, such as through on-order excess inventory. Finally, internal efficiency metrics assess things like the number of purchase requests and demand forecast accuracy. See table 3 for examples of metrics that the services review in each of the key inventory categories.

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<sup>65</sup>See [GAO-14-495](#).

**Table 3: Examples of Regularly Reviewed Metrics in Each Category by Service**

Service	Army	Navy	Air Force
Customer service <sup>a</sup>	Stock availability, backorders <sup>b</sup>	Fill rates, backorders	Asset availability, backorders
Cost	Sales <sup>c</sup> obligations <sup>d</sup>	Sales, obligations	Sales, obligations
Internal efficiency	Demand forecast accuracy <sup>e</sup>	Demand forecast accuracy	Demand forecast accuracy

Source: GAO analysis of Army, Navy, and Air Force data. | GAO-15-350

<sup>a</sup>The metric that measures availability of parts is referred to differently by each of the services. The Army calls it “stock availability,” the Navy uses the term “fill rates,” and the Air Force describes it as “asset availability.”

<sup>b</sup>Backorders are generally part shortages (i.e., the part is not available for issuance when the part is requisitioned).

<sup>c</sup>Sales are the dollar value of the inventory sold to customers of a working capital fund.

<sup>d</sup>Obligations are the dollar value of inventory that a working capital fund has committed to procure in support of customer requisitions of parts in the future. This definite commitment creates a legal liability of the government for the payment of goods and services ordered or received.

<sup>e</sup>Demand forecast accuracy is a measure of the precision of the demand forecasts that are used to build inventory levels.

The services use a number of metrics to assess their customer service, cost, and internal efficiency. Their customer-service metrics center on the availability of spare parts, as well as the number and the age of backorders.<sup>66</sup> The services’ respective materiel commands provide specific goals for key customer-service metrics and regularly monitor progress against these goals. Additional metrics are also used to assess customer-service challenges, such as customer wait time for the Navy and order response time for the Air Force.<sup>67</sup> Service cost metrics revolve around reviewing the sales, obligations, and demands that occurred over the previous month, which are key to understanding the overall health of the working capital funds.<sup>68</sup> In addition, the services look at the value of

<sup>66</sup>The actions taken by the services to reduce backorders are discussed in app. V.

<sup>67</sup>Customer wait time is a measure of how long a customer had to wait to receive a part after making a requisition. Order response time is the percent of customer orders delivered to a customer within an established standard (for example, 90 percent within 2 days).

<sup>68</sup>A working capital fund relies on sales revenue rather than direct appropriations to finance its continuing operations and is intended to (1) generate sufficient resources to cover the full costs of its operations and (2) operate on a break-even basis over time—that is, neither make a gain nor incur a loss. Customers use appropriated funds to finance orders placed with the working capital fund, and a working capital fund uses obligation authority to procure additional spare parts in advance of a customer placing an order.

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their total inventory and regularly review their on-order excess inventory performance—a cost-efficiency metric. Finally, the services have internal efficiency metrics that they use to assess inventory management performance. One of the key internal efficiency metrics is demand forecast accuracy, which was developed as part of the implementation of DOD’s *Comprehensive Inventory Management Improvement Plan*,<sup>69</sup> and is tracked by all the services.<sup>70</sup> Demand forecast accuracy is a measure of the precision of the demand forecasts that are used to build inventory levels, which is important because inaccurate forecasts can lead to either excess inventory or shortfalls. Additionally, the Navy and Air Force look at a number of other internal efficiency metrics, such as lead time variance and on-hand excess inventory.<sup>71</sup>

All three services regularly review their inventory metrics at multiple levels within their organizations. For example, the Army’s inventory management metrics are reviewed through the Sales and Operations Planning process. The process begins at the weapon system level, where an in-depth demand and supply review is conducted that looks forward over the next 24 months. Next, inventory metrics are reviewed at the life-cycle management command-level before being reviewed again at Army Materiel Command. According to officials, this entire process is designed to be forward-looking in an attempt to raise awareness of any potential concerns, shortages, or demand spikes, and occurs on a monthly basis. Likewise, the Navy’s inventory management metrics are regularly reviewed at multiple levels within Naval Supply Systems Command. Senior managers at Naval Supply Systems Command and its subordinate command—Naval Supply Systems Command Weapon Systems Support—review the metrics through a number of regularly scheduled performance management meetings. While there are no single meetings at which all of the Navy’s inventory management metrics are discussed, the regularly recurring meetings are designed to help ensure that metrics that cover key areas of inventory management, such as customer service,

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<sup>69</sup>See app. I for an overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

<sup>70</sup>The services’ demand forecasting efforts are discussed later in this report.

<sup>71</sup>Lead time variance is a measure of the difference between the acquisition lead time recorded in a system of record and the observed acquisition lead time. The services’ acquisition lead time efforts, including those related to lead time variance, are discussed later in this report.

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cost, and internal efficiency, are reviewed. Finally, with respect to the Air Force, top-level metrics are reviewed at multiple levels, and lower-level organizations also often have their own “local” set of metrics in addition to those that flow from Air Force headquarters. For example, the 448th Supply Chain Management Wing holds monthly meetings that look at its own set of metrics that measure supply-related conditions at Air Force depots.

Some of the services have web-based metrics platforms that assist the different levels within the organization in reviewing their inventory management performance metrics. For instance, the Navy has a web-based tool that provides managers at all levels with the ability to see the monthly performance for key inventory management metrics—fill rate, unfilled customer orders (i.e., backorders), first pass effectiveness, customer wait time, and logistics response time.<sup>72</sup> Navy officials can use the web-based tool to query and filter the data using numerous sorting options. For example, data can be sorted or filtered by organizations, type of item (i.e., repairable versus consumable items), or for a particular set of preidentified items. Also, officials can design reports using the web-based tool to provide performance information. Similarly, the Army is in the early stages of developing a web-based platform to allow its headquarters and life-cycle management commands to easily review inventory metrics. The Army currently has five metrics—forecast accuracy, backorders, supply availability, lead time variance, and inventory turnover—that it plans to make available through its web-based platform.<sup>73</sup>

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<sup>72</sup>First pass effectiveness is the percentage of time in which an average customer order is filled during its initial pass through the supply system (i.e., the requisition is filled and not held in a backorder status).

<sup>73</sup>Inventory turnover, or “turns,” is the dollar value of sales for a year divided by the average dollar value of inventory for that year.

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## The Services Have Efforts Focused on Improving and Monitoring Demand Forecasting and Acquisition Lead Times

The services have efforts focused on improving and monitoring demand forecasting and acquisition lead times, which are two key focus areas of the *Comprehensive Inventory Management Improvement Plan*.<sup>74</sup> The services have taken different approaches, each targeted at unique needs, to improve demand forecasting and the management of acquisition lead times. The services' efforts are in various stages of implementation, with some of them embedded into a service's routine performance management practices. In addition to the demand forecasting and acquisition lead time improvement efforts, each service also has additional efforts focused on other areas of inventory management, which are described in appendix III.

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## The Services Have Efforts Focused on Improving and Monitoring Demand Forecasting

Each of the services has efforts focused on improving and monitoring demand forecasting. DOD guidance emphasizes the importance of accurately forecasting demand to support the needs of the customer.<sup>75</sup> Our prior body of work has found that weaknesses in demand forecasting have contributed to the accumulation of excess inventory and backorders across DOD.<sup>76</sup> Improving the accuracy of demand forecasts enhances the precision of planning and funding of procurement and repair actions, results in inventory levels that better satisfy customer demand while reducing excess and backorders, and provides stability for suppliers that manufacture and repair spare parts for the services.

DOD's *Comprehensive Inventory Management Improvement Plan* is focused, in part, on the improvement of demand forecasting across the department and assists in aligning the services' demand forecasting efforts. As a part of implementing the plan, the services have participated in two key efforts—conducting several forecasting studies and developing demand forecasting metrics—focused at improving demand forecasting. Specifically, DOD conducted three forecasting studies from 2010 through 2014 that identified potential improvements to forecasting techniques and methods for each life-cycle phase—new item introduction, sustainment,

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<sup>74</sup>See app. I for an overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

<sup>75</sup>DOD Manual 4140.01, Volume 2, *DOD Supply Chain Materiel Management Procedures: Demand and Supply Planning* (Feb. 10, 2014).

<sup>76</sup>See [GAO-10-469](#), [GAO-09-199](#), and [GAO-09-103](#).

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and end-of-life—of an item.<sup>77</sup> Also, OSD, in collaboration with the services and the Defense Logistics Agency, in 2013 began to track and monitor each organization's performance in regard to accurately forecasting the demand for spare parts through two metrics—demand forecast accuracy and demand forecast bias.<sup>78</sup> Each metric relies on the difference between the forecasted demand quantity and the actual demand quantity over 12 months, but the metrics are computed differently and therefore provide different performance information.<sup>79</sup> The demand forecast accuracy metric shows the error of the forecast, with a lower percentage of accuracy signifying a larger difference (i.e., less accuracy) between forecasted demand and actual demand. The demand forecast bias metric shows the direction and magnitude of the error with a positive value meaning a bias for overforecasting (i.e., forecasting more than is needed), a negative value meaning a bias for underforecasting (i.e., forecasting less than is needed), and 0 meaning no bias.

The services' performance on the demand forecast accuracy and bias metrics has been reported across two assessment periods to date—October 2012 through September 2013 and April 2013 through March 2014—and DOD has not established goals for the metrics as of January 2015. According to officials, DOD wants to establish a baseline of performance on the metrics prior to setting any department-wide goals and is exploring establishing these goals in its next iteration of the *Comprehensive Inventory Management Improvement Plan*.

Thus far, performance on these demand forecasting metrics among the services has varied. As displayed in figure 3, the Army, Navy, and Air Force demand forecast accuracy was 32.0 percent, 50.1 percent, and

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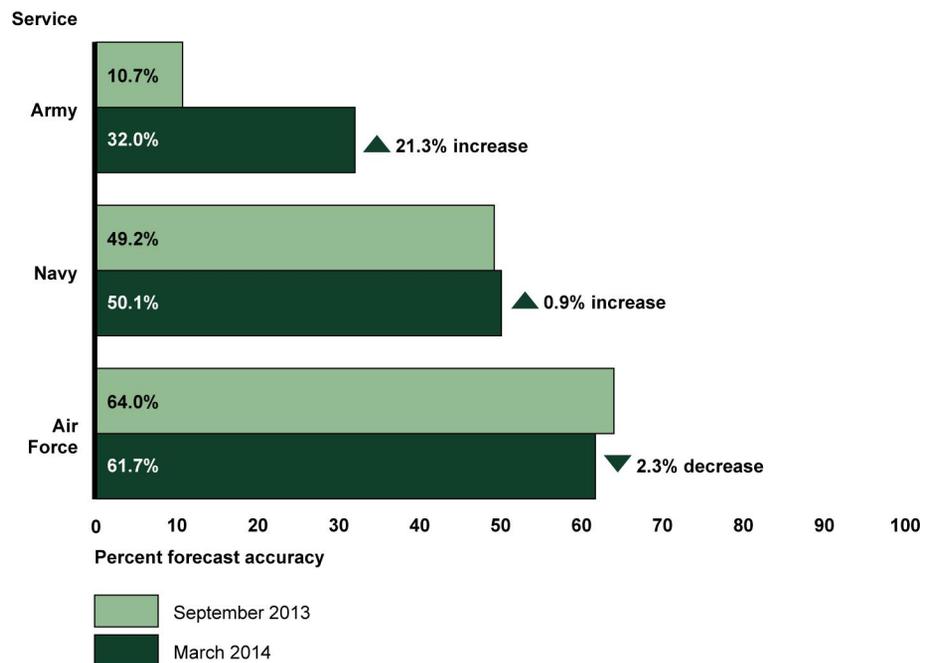
<sup>77</sup>See Logistics Management Institute, *Lifecycle Forecasting Improvement: Causative Research and Item Introduction Phase* (November 2010); Accenture, *Sustainment Lifecycle Phase Forecasting and the Impact on Business Outcomes* (July 2013); and Accenture, *Retirement Lifecycle Phase Forecasting and the Impact on Business Outcomes* (February 2014).

<sup>78</sup>These metrics focus on items that are forecastable rather than items that are unforecastable due to low or highly variable demand patterns. Items that are unforecastable are managed with alternative approaches. For example, the Defense Logistics Agency has begun to manage approximately 495,000 items with low or highly variable demand through an alternative approach since traditional forecasting methods were ineffective. See [GAO-14-495](#) for additional information on this approach.

<sup>79</sup>These metrics are dollar-weighted, which assists in better understanding effects on business outcomes.

61.7 percent, respectively, for the most recent assessment period ending March 2014. Performance across the two periods also varied for some of the services. For example, the Army's demand forecast accuracy improved by 21.3 percentage points between the two periods.

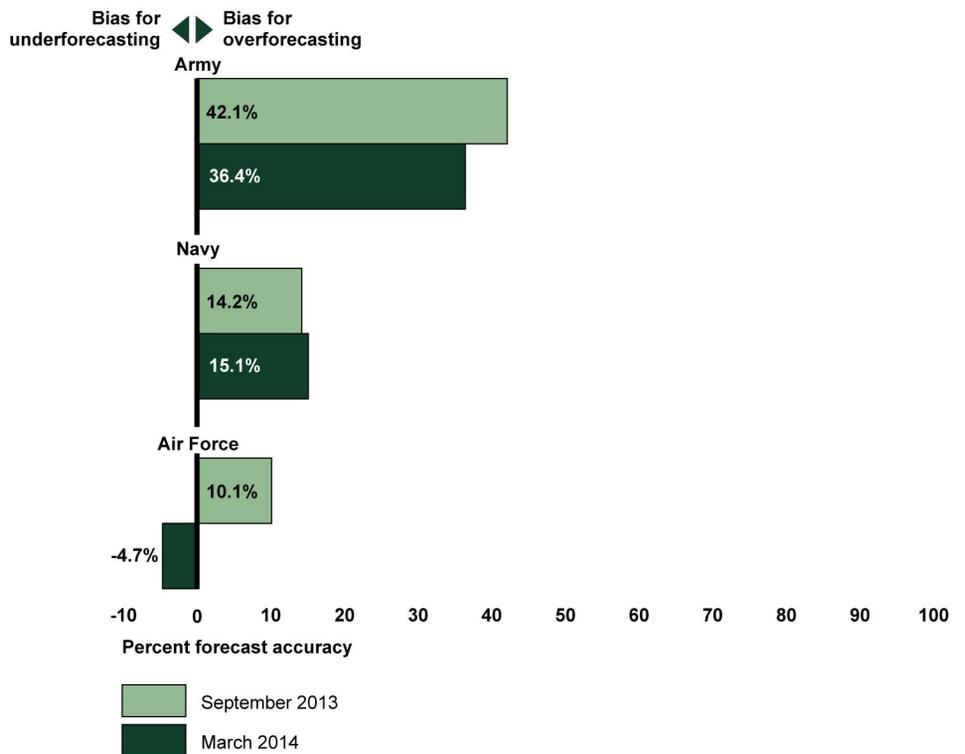
**Figure 3: Demand Forecast Accuracy Performance by Service**



Source: GAO analysis of Department of Defense (DOD) data. | GAO-15-350

As shown in figure 4, performance on the demand forecast bias metric also varied. For example, in the assessment period ending March 2014 the Army and Navy had a bias for overforecasting—36.4 and 15.1 percent, respectively—while the Air Force had a slight bias for underforecasting (-4.7 percent). Performance across the two periods also varied for some of the services. For example, the Air Force's demand forecast bias changed by nearly 15 percentage points from a bias for overforecasting of 10.1 percent in the first assessment period to a bias for underforecasting of -4.7 percent in the second assessment period.

**Figure 4: Demand Forecast Bias by Service**



Source: GAO analysis of Department of Defense (DOD) data. | GAO-15-350

The department-wide reviews of demand forecasting and the monitoring of demand forecast accuracy and bias across the services, which had not been conducted prior to 2013, have helped to increase focus on improving demand forecasting across the services, according to DOD officials. For example, OSD receives semiannual briefings from the services that include the services' performance on key inventory metrics and efforts to improve inventory management, especially in areas with performance weaknesses such as demand forecasting. The services have taken different approaches targeted at unique needs, and their efforts are in various stage of implementation, as summarized below and discussed further in appendix VI:

- Army:** In July 2014, the Army Materiel Command issued a Demand Planning Implementation Plan to guide improvements in demand forecast accuracy through more effective demand planning and the development of demand forecasting metrics. The implementation plan

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identifies milestones through the end of fiscal year 2015 and directs a process to assign roles and responsibilities for core personnel representing Army Materiel Command, its life-cycle management commands, and weapon systems. In addition to these efforts, the Army Materiel Command began to evaluate establishing inventory-level-setting policies for items with infrequent or highly variable demand in July 2014 with results due in early 2015.<sup>80</sup>

- **Navy:** Naval Supply Systems Command is reviewing and analyzing their demand forecasting processes and planning factors to improve performance on DOD's forecast accuracy and bias metrics tracked across the department. For example, the Navy is exploring changes to its forecast methodology and the number of quarters used to compute its forecasts, and segmenting inventory items into demand categories—high, medium, and low demand—to analyze potential differences in demand forecast accuracy across the segments.<sup>81</sup> Naval Supply Systems Command plans to report its analyses and planned actions to OSD in March 2015 as a part of its semiannual briefing on its inventory management.
- **Air Force:** Air Force Materiel Command has been conducting forecast accuracy improvement efforts since 2008 and has institutionalized the demand forecast accuracy metric throughout the 448th Supply Chain Management Wing since 2009. The Air Force has a number of initiatives geared toward improving demand forecasting. For example, a key Air Force Sustainment Center initiative is its ongoing effort to review 200 items every quarter with personnel who

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<sup>80</sup>The Defense Logistics Agency has already begun to manage approximately 495,000 consumable items with low or highly variable demand through an alternative approach since traditional forecasting methods were ineffective. However, the Army's efforts are focused on repairable items that have infrequent or highly variable demand and this focus introduces additional complexity since repairable items can be repaired, according to officials. Thus, the Defense Logistics Agency's processes used for consumable items are not directly transferable to repairable items. See [GAO-14-495](#) for additional information on the Defense Logistics Agency's approach.

<sup>81</sup>Naval Supply Systems Command largely uses exponential smoothing with a backcasting technique to forecast demand for its items on a quarterly basis. Backcasting refers to the technique of exponentially smoothing back to the earliest quarter of demand to find what the forecast would have been at that time and then starting with that forecast and exponentially smoothing forward through all quarters. Naval Supply Systems Command generally uses 5 years of demand history to detect long-term trends in demand, but the number of years of demand history used can be altered if necessary, such as in cases of peak demand.

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provide key inputs into setting demand forecasts.<sup>82</sup> Overall, the Air Force tracks the progress toward milestones in most of its initiatives as part of its effort to achieve an overall goal of 75 percent demand forecast accuracy.

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## The Services Have Efforts to Improve and Monitor Acquisition Lead Times

Each of the services has efforts focused on improving and monitoring acquisition lead times. Acquisition lead time is the time interval between identifying a need to purchase an item and the receipt of the item into the supply system. Acquisition lead times have two primary components: (1) administrative lead time, which is the time between identifying the need to purchase and the award of a contract; and (2) production lead time, which is the time between when the contract is awarded and when the item is delivered to the customer. We found in March 2007 that the management of acquisition lead times is important in maintaining cost-effective inventories, budgeting, and having material available when needed, as lead times are DOD's best estimate of when an item will be received.<sup>83</sup> Furthermore, DOD guidance and metrics emphasize the importance of managing and reducing acquisition lead times. Our prior body of work has found, and third-party reports<sup>84</sup> have noted, that incorrect and long acquisition lead times can create on-hand excess inventory and backorders.<sup>85</sup> Furthermore, our work has shown that reducing acquisition lead times can result in a reduction of the overall investment in inventory by minimizing the amount of inventory that needs to be held to meet demand during the acquisition lead time.

DOD's *Comprehensive Inventory Management Improvement Plan* is focused, in part, on the improvement of acquisition lead time

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<sup>82</sup>According to Air Force officials, the items selected for review change over time. For example, the Air Force has previously selected the two "top" items for each equipment specialist. It has also previously selected items with low demand forecast accuracy and those that were outliers from standard deviations. According to officials, root cause analysis is performed on the selected items to extrapolate lessons for future demand forecasting.

<sup>83</sup>See [GAO-07-281](#).

<sup>84</sup>See [GAO-07-281](#), [GAO-14-495](#), and RAND National Defense Research Institute, *Integrating the Department of Defense Supply Chain* (2012).

<sup>85</sup>If the acquisition lead time is overstated, the planners may purchase more inventory than necessary, potentially leading to excess. If the acquisition lead time is understated, then supply planners will not purchase enough of an item, and there will be a risk for backorders.

management across the department and assists in aligning the services' acquisition lead time efforts. Specifically, in fiscal year 2013 DOD and the services, as a part of the plan, began monitoring acquisition lead time variance, which is a measure of the difference between the acquisition lead time recorded in a system of record (and used for planning purposes) and the acquisition lead time experienced. The metric is calculated for both the administrative and production lead times, and the department-wide goal is for the average variance across all items to be less than +/-30 days for each type of lead time. Since the metric is a mean average of the variances across all items with an observation, individual observations that are over or under the +/-30 day variance target may produce an average that meets the department-wide goal.

The services' performance on the acquisition lead time variance metric has varied, as shown in table 4. Each of the services is meeting the average variance target of +/-30 days for production lead time when considering all items from the most recent available quarterly data (January through March 2014), but the Army and Navy are not meeting the target for administrative lead time. The aggregate average administrative and production lead time variance across the services, as well as the Defense Logistics Agency, has been increasing since the beginning of fiscal year 2013 and is being overstated by 23 days and 70 days, respectively, based on the most recent quarterly data.<sup>86</sup>

**Table 4: Service Quarterly Performance on Average Variance Metric for Acquisition Lead Time, April 2013–March 2014**

Service	Met average variance of +/- 30 days for administrative lead times				Met average variance of +/- 30 days for production lead times			
	April–June 2013	July–September 2013	October–December 2013	January–March 2014	April–June 2013	July–September 2013	October–December 2013	January–March 2014
<b>Army</b>	Yes	No	No	No	No	No	No	Yes
<b>Navy</b>	No	No	No	No	Yes	Yes	Yes	Yes
<b>Air Force</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Army, Navy, Air Force, and DOD data. | GAO-15-350

<sup>86</sup>The department-wide data include data from each of the services, including the Marine Corps, and the Defense Logistics Agency.

The services also track the distribution of the lead time variances on a quarterly basis, as summarized in table 5. This analysis provides insight on the percentage of items for the respective quarter that were understated, within the +/-30 day variance target, or overstated with regard to lead times.<sup>87</sup> The percentage of items meeting the variance target for administrative lead time is as low as 23 percent (Navy) and as high as 41 percent (Air Force). With respect to production lead times, the services are meeting the variance target of +/-30 days for 16 to 20 percent of items.

**Table 5: Acquisition Lead Time Variance Distribution, January–March 2014**

Type of Lead Type	Understated or in target range or overstated	Air Force		
		Army	Navy	Air Force
Administrative lead time	Percentage of items understated	24	43	33
	Percentage of items in target range (+/-30 days)	31	23	41
	Percentage of items overstated	45	34	26
Production lead time	Percentage of items understated	36	36	36
	Percentage of items in target range (+/-30 days)	20	17	16
	Percentage of items overstated	43	47	48

Source: Army, Navy, Air Force, and DOD data. | GAO-15-350

Note: Percentage total may not add to 100 due to rounding.

OSD and the services also look at the distribution of the items' variances for administrative and production lead times from -300 days to +300 days in 30-day increments, which according to officials provides additional insight into performance. For example, 63 percent and 51 percent of the Army's items have variances within +/-90 days for administrative and production lead times, respectively, for the January through March 2014 quarter. By looking at the distribution across 30-day increments, OSD and the services are able to assess performance in much more detail—for example, what percentage of an item's variances falls within a given range of days—and also to assess whether the +/-30 day goal is practical

<sup>87</sup>For example, if an item has a recorded administrative lead time of 100 days and an observed administrative lead time of 60 days, then the lead time variance is 40 days, which is an overstated lead time.

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given the expected and experienced variation between recorded and observed lead times across items.

OSD officials emphasized that acquisition lead time variance metrics are providing useful insight into the accuracy of lead times and that the department continues to evaluate the metric, its target of +/-30 days, and how to improve performance. These officials noted that it is important to recognize that this type of metric previously had not been consistently collected across the department, and the department is now focused on driving performance improvements. However, these officials also noted that the services have much more influence over administrative lead times than production lead times, which depend on the performance of commercial suppliers of spare parts.

The development of the acquisition lead time variance metric in 2013 has helped to increase focus on the issue across the services, according to DOD officials. The services have taken different approaches targeted at unique needs, and their efforts are in various stages of implementation, as summarized below and discussed further in appendix VII:

- **Army:** Army Materiel Command is monitoring the accuracy of lead times and establishing action steps and milestones to improve the accuracy of acquisition lead times. Specifically, the Army has institutionalized processes for the management of lead times and began an effort in June 2014 that is evaluating ways to improve the Army's supply planning process, including evaluating its supply planning factors, such as acquisition lead times.
- **Navy:** Naval Supply Systems Command has taken actions to improve the accuracy of acquisition lead times. For example, in the summer of 2014, Naval Supply Systems Command Weapon Systems Support segmented its maritime items based on the amount of demands received on an item and began to manage the segment of items with the greatest demand using unique planning factors, including administrative lead times. Additionally, the Navy is reevaluating the methodology used in calculating administrative lead times for the remainder of the maritime items and all of its aviation items, with the plan of implementing updated administrative lead times for these items once the evaluation is complete.
- **Air Force:** The Air Force Sustainment Center has institutionalized several processes that are designed to continually improve the management of acquisition lead times and has enhanced its

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monitoring of lead time metrics. For example, the 448th Supply Chain Management Wing has established a broader set of metrics, including assessing the number of days for lead times against goals, as of early fiscal year 2015. In addition, the 448th Supply Chain Management Wing is working through broader Air Force efforts, such as the Strategic Commodity Sourcing and the Supplier Relationship Management programs, to reduce acquisition lead times through establishing long-term contracts to obtain parts.

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## Conclusions

As holders of roughly four-fifths of DOD's inventory as of September 2013, the Army, Navy, and Air Force must maximize the effectiveness and efficiency of their inventory management operations to ensure that they are not expending resources that could be better utilized elsewhere. Integral to that effort is the importance of limiting the accumulation of excess inventory, both on-hand and on-order. To that end, maintaining visibility over inventory levels through accurate data collection, analysis, and reporting can help DOD and the services avoid budgetary and readiness challenges that could arise from accumulating excess or experiencing shortages. The services, working independently and with DOD through the implementation of the *Comprehensive Inventory Management Improvement Plan*, have taken many steps to improve their inventory management processes.

There are, however, areas for further improvement. For instance, the Army's inaccurate reporting of its inventory may be resolved once revisions to its inventory stratification process are approved and implemented in May 2016. Nonetheless, without correcting its calculations of the approved acquisition objective, it will be difficult for the Army and DOD to accurately report on the amount and purposes—economic or contingency—for which the Army is retaining inventory and the success of the Army's efforts to reduce its level of on-hand excess inventory. Also, having visibility over contractor-managed inventory is important in regard to determining the total inventory owned by the services. However, including this contractor-managed inventory in the calculation of the percentage of on-hand excess inventory can result in understating levels of excess for inventory managed by the department. Without excluding this contractor-managed inventory from calculations of on-hand excess, OSD and the services will be unable to readily determine the full extent to which service efforts are supporting DOD's goal of reducing excess inventory managed by the department.

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Improving inventory management also requires setting appropriate inventory reduction goals, in accordance with federal standards for internal control and leading management practices, and making accurate and timely determinations of how much inventory to retain for economic and contingency reasons, in accordance with DOD guidance. For instance, the Army set a goal for reducing its overall inventory without an analysis of Army data. Without conducting an analysis of appropriate data, including examining the amount of inventory expected to return from overseas contingency operations, and making revisions to its goal, the Army could potentially dispose of inventory that is needed or should be retained per its guidance. In contrast, the Air Force may be retaining inventory that it has not adequately vetted to determine whether continued retention is justified, and therefore may be retaining spare parts in its inventory that are not needed and should be disposed of to save the Air Force storage costs. The Air Force plans to conduct a review of its inventory that is currently categorized as economic retention stock, but not before it has a new methodology in place, which is not estimated to happen until at least the second half of 2016. Without beginning a review of those items it already knows are improperly categorized as economic retention stock—approximately \$2.6 billion in inventory—and that may be excess, the Air Force risks paying potentially millions of dollars to continue to store them. In addition, the Air Force cannot accurately report the amount of its contingency retention stock and excess inventory, which obscures the Air Force’s progress achieving DOD goals.

Finally, DOD guidance and the *Comprehensive Inventory Management Improvement Plan* emphasize a focus on managing and reducing on-order excess inventory. Without setting on-order excess goals that are specific to the life-cycle management commands and monitoring those goals, the Army will not be assured that it is supporting DOD’s goals in this area. Furthermore, the Army could face challenges with reducing on-hand excess inventory in the future given large amounts of on-order excess inventory. Similarly, the Navy’s efforts to reduce on-order excess would be strengthened by further oversight. Without incorporating a required management review process into its current processes for contract termination, the Navy will be hampered in its efforts to determine when further opportunities to reduce on-order excess inventory are present, thus not positioning the Navy to invest only in inventory that meets its customer’s needs. Furthermore, without incorporating the required management review process and ability to track and review the reasons for not canceling or modifying on-order excess items into its termination module that is under development, the Navy would be

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missing an opportunity to automate processes required by DOD guidance.

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## Recommendations for Executive Action

We are making seven recommendations to enhance the military services' ability to effectively and efficiently manage their inventory.

To help ensure that the Army calculates its requirements for spare parts in accordance with Army guidance, and that OSD has accurate information to manage and oversee the department's progress in reducing on-hand excess inventory, we recommend that the Secretary of the Army direct the Commander, Army Materiel Command, to correct its calculation of the approved acquisition objective to include 2 years of demand data, as officials state the Army is taking steps to do.

To balance DOD's continuing efforts to gather and report data on its contractor-managed inventory with ensuring the accuracy of its metric used to measure progress reducing on-hand excess inventory, we recommend that the Secretary of Defense direct the Assistant Secretary of Defense for Logistics and Materiel Readiness, in conjunction with the services, to exclude contractor-managed spare parts from calculations of the percentage of on-hand excess inventory.

To help ensure that the Army has established appropriate goals to guide improved performance, in accordance with federal standards for internal control, we recommend that the Secretary of the Army direct the Commander, Army Materiel Command, to reassess its on-hand inventory reduction goal based on analysis of corrected Army inventory stratification data and other relevant inventory factors such as inventory returning from overseas operations, and revise the goal, as necessary, based on the results of the analysis.

To help ensure that the Air Force is properly retaining items and accurately reporting its amount of retention stock and excess inventory in accordance with DOD guidance, and not spending resources to store unneeded inventory, we recommend that the Secretary of the Air Force direct the Commander, Air Force Materiel Command, to begin performing contingency retention reviews for those items, valued at about \$2.6 billion, that it already knows should not be retained as economic retention stock so that it can identify and promptly dispose of inventory that is not needed.

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To improve management and minimize the amount of on-order excess inventory in accordance with DOD's on-order excess inventory reduction goal, and to be consistent with federal standards for internal control and leading practices for results-oriented management, we recommend that the Secretary of the Army direct the Commander, Army Materiel Command, to develop life-cycle management command-specific goals for the reduction of on-order excess inventory and monitor these goals.

To help ensure that the Navy has adequate oversight of on-order excess inventory termination decisions and necessary performance measures consistent with DOD guidance, we recommend that the Secretary of the Navy direct the Commander, Naval Supply Systems Command, to take the following two actions:

- incorporate graduated management reviews based on dollar value thresholds into its current on-order excess inventory termination practices, and
- incorporate the graduated management reviews and the ability to track and review the reasons for not canceling and modifying on-order excess items into its automated termination module that is under development.

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## Agency Comments and Our Evaluation

We provided a draft of this report to DOD for comment. In written comments, DOD concurred with our seven recommendations. DOD's comments are reprinted in their entirety in appendix VIII. DOD also provided technical comments, which we incorporated into the report as appropriate.

DOD concurred with our four recommendations aimed at improving the visibility and management of on-hand excess inventory. First, DOD stated that the Army will correct its calculation of the approved acquisition objective to include 2 years of demand data and incorporate this change into its Supply Chain Planning Reporting Tool during fiscal year 2016. With respect to the calculation of the percentage of on-hand excess inventory, DOD stated that the Assistant Secretary of Defense for Logistics and Materiel Readiness, in conjunction with the services, will begin excluding contractor-managed inventory from its calculation during fiscal year 2015 and would update its policy to reflect this change by the end of fiscal year 2016. Also, the Army plans to reassess its on-hand inventory reduction goal based on data analysis during fiscal year 2015 and the Air Force plans to begin performing contingency retention reviews

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in May 2015 on about \$2.6 billion of its inventory that had been improperly categorized as economic retention stock, in order to identify and promptly dispose of items that should not be retained.

DOD also concurred with our three recommendations aimed at improving the management of on-order excess inventory and minimizing the amount of on-order excess inventory. DOD stated that the Army will develop life-cycle management command goals for the reduction of on-order excess inventory and begin reviewing these goals in their monthly Sales and Operations Planning meetings by June 2015. Also, the Navy plans to incorporate graduated management reviews based on dollar value thresholds into its on-order excess inventory review process by the end of fiscal year 2015, and include these reviews and the reasons for not cancelling or modifying on-order excess inventory into the Navy's automated termination module by fiscal year 2019.

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We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense, the Secretaries of the Army, Navy, and Air Force; and the Director, Defense Logistics Agency. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>. If you or your staff have questions about this report, please contact me at [merrittz@gao.gov](mailto:merrittz@gao.gov) or (202) 512-5257. GAO staff who made key contributions to this report are listed in appendix IX.



Zina D. Merritt  
Director  
Defense Capabilities and Management

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# Appendix I: The Department of Defense's (DOD) Inventory Improvement Plan

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## Background

In late fiscal year 2010, DOD began implementing its Comprehensive Inventory Management Improvement Plan, which was developed and implemented in response to a provision of the National Defense Authorization Act for Fiscal Year 2010.

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## Oversight of the Plan's Implementation

The Deputy Assistant Secretary of Defense for Supply Chain Integration oversees the plan's implementation through progress-review meetings held about monthly. The Supply Chain Executive Steering Committee, which comprises executive-level members from the services and the Defense Logistics Agency (DLA), advises the Deputy Assistant Secretary of Defense for Supply Chain Integration on matters related to supply chain management, including the implementation of the plan, and typically receives a briefing on the plan's implementation every 3 months. Additionally, any unresolved issues with respect to the plan's implementation are discussed and resolved at the Joint Logistics Board, which comprises senior-level participants from the services, combatant commands, and DLA. The Joint Logistics Board is responsible for reviewing the status of DOD's logistics portfolio and the effectiveness of the defense-wide logistics chain in supporting the warfighter.

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## Goals of the Plan

The plan has two overarching goals, which are to reduce (1) total on-order excess inventory (i.e., already-purchased items that may be excess due to subsequent changes in requirements) to 6 percent of total on-order obligated dollars by the end of fiscal year 2014 and to 4 percent by the end of fiscal year 2016 and (2) on-hand excess inventory (i.e., items categorized for potential reuse or disposal) to 8 percent of the total value of inventory by the end of fiscal year 2016.

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## The Structure of the Plan

To achieve the plan's goals, DOD developed nine subplans that include an objective, supporting actions with milestones, and performance measures to track results. See table 6 for the objectives of the subplans.

**Table 6: The Nine Subplans and Corresponding Objectives**

Subplans	Objective of the subplan
1. Demand forecasting	To improve the prediction of future demand so that inventory requirements more accurately reflect actual needs.
2. Total asset visibility <sup>/a/</sup> and multiechelon modeling <sup>/b/</sup>	To minimize the size of purchases by considering all accessible inventories.
3. On-order excess inventory	To reduce or terminate purchases that result in inventory excesses due to a decrease in requirements.
4. Economic retention stock	To ensure economic retention decisions are based on current cost factors and economic principles.
5. Contingency retention stock	To ensure the military services and the Defense Logistics Agency (DLA) justify the retention of contingency retention stock.
<sup>6.</sup> Storage and direct vendor delivery <sup>/c/</sup>	To use commercial vendors to store items when use of vendors represents the best value to the government.
7. Items with no demand	To eliminate items with a history of no recurring demand and a low probability of future demand, unless there is sufficient justification for the retention of the item.
8. Disposition of potential reutilization stock (i.e., on-hand excess inventory)	To ensure timely disposition of items categorized as potential reutilization stock.
9. Other inventory improvement efforts	To accomplish several cross-functional improvements, including revising current inventory categories to better reflect the rationale behind retaining the inventory, improving acquisition lead times, and establishing department-wide metrics for inventory management.

Source: The Department of Defense (DOD). | GAO-15-350

Notes:

<sup>a</sup>Total asset visibility is the capability to provide all users with timely and accurate information about the location, movement, status, and identity of supplies and the capability to act on this information.

<sup>b</sup>Multiechelon modeling is the use of mathematical models that compute the optimal number and type of parts needed at the wholesale and retail levels to achieve readiness and cost goals.

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**Appendix I: The Department of Defense's  
(DOD) Inventory Improvement Plan**

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<sup>c</sup>Direct vendor delivery is a materiel acquisition and distribution method that requires supplier delivery directly to the customer, which can reduce the storage of items by the services and DLA.

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# Appendix II: Scope and Methodology

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To assess the extent to which the services<sup>1</sup> have developed and met targets to reduce on-hand and on-order excess inventory, we analyzed the Army's 2011–2013 end of fiscal year inventory reports, the Navy's 2012–2013 end of fiscal year reports, the Air Force's 2009–2013 end of fiscal year inventory reports, and the March 2014 inventory report for each of the services.<sup>2</sup> We selected this time frame because fiscal year 2009 data were used as the baseline for the *Comprehensive Inventory Management Improvement Plan* and March 2014 data were the latest available at the time we conducted our field work. Each service stratifies its inventory into categories to assess the ability of the inventory to meet its respective requirements and ensure that surplus inventories are kept only if warranted.<sup>3</sup> In our analysis we reviewed inventory data managed by the Army's Logistics Modernization Program, the Navy's Enterprise

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<sup>1</sup>This report does not address the Marine Corps' inventory management. The Navy manages aviation spare parts for the Marine Corps' helicopters and airplanes, but the Marine Corps manages its nonaviation spare parts, which in 2013 were valued at approximately \$930 million, or less than 1 percent of the value of DOD's secondary inventory.

<sup>2</sup>With respect to the Army, we did not examine inventory stratification data prior to the end of fiscal year 2011 because it was partially produced by the Army's legacy system and is not comparable with data produced by the Army's enterprise resource planning system. With respect to the Navy, we did not examine inventory stratification data produced by its legacy systems prior to the end of fiscal year 2012 because the data are not comparable with data produced by the Navy's Enterprise Resource Planning system. An enterprise resource planning system is an automated information system using commercial off-the-shelf software and consisting of multiple, integrated functional modules that perform a variety of business-related tasks, such as accounting; inventory forecasting, purchasing, management, and distribution; and scheduling work.

<sup>3</sup>Per DOD guidance, the services are required to stratify and report inventory data biannually as of March 31 and September 30 and use the inventory stratification data to assess the ability of the inventory to meet the stated requirement and ensure that surplus inventories are only kept if warranted. DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting* (Feb. 10, 2014), and Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition* (Feb. 10, 2014).

Resource Planning system,<sup>4</sup> and the Air Force's D200 system,<sup>5</sup> which is a legacy system the Air Force uses to track most of its inventory. To assess the reliability of the data, we reviewed Department of Defense (DOD) requirements for secondary spare parts inventory reporting, compared the individual item data we generated from Army- and Air Force-provided electronic files to the services' respective summary inventory reports and performed checks on the Navy's data to ensure that subsets of the data matched the Navy's summary inventory report.<sup>6</sup> We identified and reconciled inconsistent information (e.g., out-of-range and missing data), and discussed the inventory data and our findings with officials from each respective service. We determined that the inventory data that we include in this report were sufficiently reliable for determining the amount of each service's inventory and the reasons for holding that inventory.

With respect to on-hand excess inventory, we determined each service's total amount of on-hand inventory and categorized this on-hand inventory by the reasons the services were retaining it, such as economic or contingency reasons. Our analyses reflect points in time, specifically at the end or midpoint of a fiscal year, and requirements and inventory levels are constantly fluctuating. We compared the results of our data analysis with DOD's on-hand excess goals and applicable Standards for Internal Control in the Federal Government<sup>7</sup> and results-oriented

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<sup>4</sup>Our analysis of Navy inventory included all items managed as part of the Navy Working Capital Fund, which includes approximately 313,000 aviation and maritime spare parts. The Navy manages aviation spare parts for the Marine Corps' helicopters and airplanes, but the Marine Corps manages its other inventory, and we did not assess the latter.

<sup>5</sup>The materiel tracked in the Air Force's D200 system primarily comprises aircraft components and parts, as well as missile parts. Elements not included in the data we reviewed include General Support Division items, cryptological items, medical/dental items, U.S. Air Force Academy items, as well as principal items such as complete engine assemblies. Munitions, foreign military sales, and certain other items such as Cartridge Actuated Devices / Propellant Actuated Devices are also not included.

<sup>6</sup>Due to the implementation of the Navy Enterprise Resource Planning system that occurred from 2010 through 2012, the Navy was not able to generate a file with individual item data for all items. Therefore, we analyzed subsets of the data and whether these subsets of data were consistent with higher-level summary reports to ensure that the data were reliable for our purposes.

<sup>7</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

management practices<sup>8</sup> that emphasize the importance of reviewing and validating performance measures to ensure the metrics are measuring the intended outcome and remain appropriate.

With respect to on-order excess inventory, we analyzed the Army, Navy, and Air Force inventory data to determine the amount of on-order excess inventory and assessed that against DOD performance requirements found in the *Comprehensive Inventory Management Improvement Plan*.<sup>9</sup> We also reviewed each service's processes for managing and overseeing on-order excess inventory and compared each service's processes against DOD guidance.<sup>10</sup> Also, we compared the services' processes to applicable Standards for Internal Control in the Federal Government and leading practices for results-oriented management, which together emphasize the importance of reviewing performance measures and progress achieving goals at the functional or activity level and linking the goals of component organizations to departmental strategic goals.<sup>11</sup>

With respect to both on-hand and on-order excess inventory, we also examined performance management briefings that included documentation related to the services' efforts to manage their inventory; inventory management policies and procedures; and other reports and analyses related to Army, Navy, and Air Force inventory management. Additionally, we reviewed DOD's Supply System Inventory Report, which is published annually, and provides summary information on DOD's

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<sup>8</sup>GAO, *Managing for Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005). In that report, we reviewed relevant literature and interviewed officials from five federal agencies to identify uses of performance information and practices that encourage the use of performance information. Based on this work, we then developed a conceptual framework identifying four categories of uses of performance information and five categories of practices that contribute to using performance information.

<sup>9</sup>This plan established a year-by-year performance target through the end of fiscal year 2016, for each service to meet at the end of each fiscal year.

<sup>10</sup>DOD Manual 4140.01, Volume 3, *DOD Supply Chain Materiel Management Procedures: Materiel Sourcing* (Feb. 10, 2014). This manual requires, among other things, the services to establish a management process for excess on-order assets that seeks to minimize those excess assets where cost-effective and in the best interests of the U.S. government. Specifically, DOD guidance requires that the management process for on-order excess inventory include graduated levels of review based on dollar thresholds for deciding when to reduce, cancel, or retain on-order excess assets.

<sup>11</sup>[GAO/AIMD-0021.3.1](#) and [GAO-05-927](#).

inventories. We interviewed officials from each service to discuss efforts to manage its on-hand and on-order excess inventory. Additionally, we reviewed DOD inventory management policies and met with officials from the Office of the Secretary of Defense, specifically representatives of the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration, to discuss Army, Navy, and Air Force efforts.

To assess the extent to which the services balance the timely availability of spare parts with supply chain costs in their inventory management metrics, we analyzed DOD and service policies, regulations, and guidance pertaining to the use of metrics for the management of inventory. We reviewed documentation, such as performance management briefing slides, and analyzed the services' use of metrics to manage their inventory against DOD guidance, which requires the services to be responsive to customer requirements while balancing risk and costs, conduct periodic performance and cost evaluations, and adopt metrics that provide information on customer service, cost, and internal efficiency.<sup>12</sup> Specifically, we assessed a service as using a particular type of metric providing information on customer service, cost, or internal efficiency if the metric was a regular part of service inventory management performance reviews. We also conducted interviews with service and Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration officials to understand and corroborate the use of performance metrics used to inform inventory management decisions.

To determine the extent to which the services have implemented and monitored efforts to improve demand forecast accuracy and acquisition lead times, we identified each services' efforts and analyzed these efforts in conjunction with broader DOD efforts—namely the *Comprehensive Inventory Management Improvement Plan*.<sup>13</sup> We focused on demand forecasting and acquisition lead time efforts because our prior work and third parties have identified these issues as key weaknesses in DOD's

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<sup>12</sup>DOD Instruction 4140.01, *Supply Chain Materiel Management Policy* (Dec. 14, 2011), and DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting*.

<sup>13</sup>Acquisition lead time is the time interval between identifying a need to purchase an item and receipt of the item into the supply system. Acquisition lead times have two primary components: administrative lead time, which is the time between identifying the need to purchase and the award of a contract, and production lead time, which is the time between when the contract is awarded and when the item is delivered to the customer.

inventory practices, and DOD has also emphasized these issues in its improvement efforts.<sup>14</sup> We reviewed guidance and documentation issued at the departmentwide level as well as by the services.<sup>15</sup> We obtained available information from each of the services, including briefings prepared by service officials on how demand forecast accuracy and acquisition lead times have changed since improvement efforts began to be implemented in 2010, the current status of these efforts, and program or timeline risks associated with implementing the efforts. We also interviewed officials from each of the services to determine the expected outcome or effect for individual initiatives and, if available, implementation schedules, steps taken to implement the initiatives, and progress made in achieving desired results. Additionally, we interviewed officials from the Office of the Secretary of Defense about the services' efforts, if any, related to improving demand forecast accuracy and acquisition lead times as well as the implementation of other initiatives to improve inventory management and discussed the department-wide approach to developing and reporting on the initiatives.

To support our analysis on each of the objectives, we contacted or interviewed officials from the following organizations:

- Office of the Secretary of Defense, Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness, and its subordinate Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration

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<sup>14</sup>With respect to demand forecasting, see GAO, *Defense Inventory: Defense Logistics Agency Needs to Expand on Efforts to More Effectively Manage Spare Parts*, [GAO-10-469](#) (Washington, D.C.: May 11, 2010); *Defense Inventory: Army Needs to Evaluate Impact of Recent Actions to Improve Demand Forecasts for Spare Parts*, [GAO-09-199](#) (Washington, D.C.: Jan. 12, 2009); and *Defense Inventory: Management Actions Needed to Improve the Cost Efficiency of Navy's Spare Parts Inventory*, [GAO-09-103](#) (Washington, D.C.: Dec. 12, 2008); Logistics Management Institute, *Lifecycle Forecasting Improvement: Causative Research and Item Introduction Phase* (November 2010); Accenture, *Sustainment Lifecycle Phase Forecasting and the Impact on Business Outcomes* (July 2013); and Accenture, *Retirement Lifecycle Phase Forecasting and the Impact on Business Outcomes* (February 2014). With respect to acquisition lead times, see GAO, *Defense Inventory: Opportunities Exist to Improve Management of DOD's Acquisition Lead Times for Spare Parts*, [GAO-07-281](#) (Washington, D.C.: Mar. 2, 2007), and RAND National Defense Research Institute, *Integrating the Department of Defense Supply Chain* (2012).

<sup>15</sup>DOD Manual 4140.01, Volume 2, *DOD Supply Chain Materiel Management Procedures: Demand and Supply Planning* (Feb. 10, 2014).

- Office of the Deputy Chief of Staff of the Army, Logistics
- U.S. Army Materiel Command, Headquarters
- U.S. Army Aviation and Missile Life Cycle Management Command
- U.S. Army Communications-Electronics Life Cycle Management Command
- U.S. Army Tank-automotive and Armaments Life Cycle Management Command
- U.S. Army Materiel Systems Analysis Activity
- U.S. Army Program Executive Office Enterprise Information Systems (Logistics Modernization Program)
- U.S. Navy Supply Systems Command, Headquarters
- U.S. Navy Supply Systems Command, Weapon Systems Support
- Office of the Air Force Deputy Chief of Staff, Logistics
- U.S. Air Force Materiel Command, Headquarters
- U.S. Air Force Life Cycle Management Center
- U.S. Air Force Sustainment Center
- U.S. Air Force Sustainment Center, 448th Supply Chain Management Wing

We conducted this performance audit from October 2013 to April 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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# Appendix III: Additional Service Efforts to Improve Inventory Management

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The Army, Navy, and Air Force, in addition to efforts aimed at improving demand forecasting and acquisition lead time, are working to improve others areas of their inventory management. For example, the Army has implemented a new framework to manage and oversee its supply chain and inventory management. The Navy is in the early stages of implementing actions to improve its management of items with no demand. The Air Force has been implementing and tracking efforts to improve the cost-effectiveness of its inventory management and supply chain operations since 2012.

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## The Army's Implementation of a New Management Process Is Its Key Inventory Management Improvement Effort

In January 2013, the Army began to implement a Sales and Operations Planning (S&OP) process to improve its supply chain and inventory management. According to the Army Materiel Command officials, the Army's decision to implement S&OP was recommended by an Integrated Project Team that concluded the Army could leverage commercial best practices to improve supply chain performance. Supply and demand data at the weapon system level provide the primary source of information for S&OP. This data are presented at monthly review meetings at various management levels. Ultimately, S&OP is designed to help ensure senior management has visibility for supply chain issues, and it seeks to align demand and supply plans across a forward-looking 24-month horizon to support predetermined strategic goals, such as a shift from overseas counterinsurgency contingency operations to domestic full spectrum training. S&OP also integrates financial considerations into inventory planning.

S&OP uses a series of monthly meetings to enhance communication and inform decision making across the supply chain through a continuous process. The key meetings in the Army's S&OP process, as shown below in figure 5, are the following:

1. **Product Management Review:** Weapon system teams and item managers in collaboration with acquisition product managers focus on determining any changes to new or existing weapon systems that affect demand and supply planning for items in support of the respective weapon systems.
2. **Demand Review:** Weapon system teams and item managers at the life cycle management commands review demand projections across the planning horizon for the respective weapon system.
3. **Supply Review:** Weapon system teams and item managers at the life cycle management commands review supply projections across the planning horizon for the respective weapon system.

4. Integrated Reconciliation Review: Senior management at Army Materiel Command and its life cycle management commands review information from the product management, demand, and supply review meetings; integrate financial considerations to ensure supply can meet demand and prevent an adverse effect on readiness within financial constraints; and make adjustments as necessary.
5. Management Business Review: Senior management at Army Materiel Command and its life-cycle management commands compares supply chain performance against key indicators and addresses performance issues as needed.

Figure 5: Overview of Army Sales and Operations Planning Meetings and Process



Source: GAO analysis of Army information. | GAO-15-350

Army Materiel Command officials stated that S&OP has been implemented across the supply chain enterprise and despite initial cultural resistance to change, S&OP has yielded positive results. Specifically, they stated that S&OP has improved communications across functional disciplines (e.g., financial, supply chain, and acquisition) and resulted in better integration of budget considerations into supply and demand planning. S&OP has also increased management focus on supply chain performance, and officials said they expect S&OP to support other supply

chain improvement efforts. Lastly, Army Materiel Command officials emphasized that the S&OP process must be supported by a human capital transformation. Specifically, in August 2012, an Army Materiel Command plan noted that there are no clearly defined enterprise competencies, training, and credentialing requirements for supply chain personnel, and oversight of human capital had diminished during a decade of mission support with high operational tempos. As a result, Army Materiel Command has developed a human capital implementation plan that seeks to address these issues, and implementation began in April 2014.

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### The Navy Is Implementing Improvements for the Management of Items with No Demand

The Navy is in the early stages of implementing actions to improve its management of items with no demand. The actions are being taken in response to a report by the DOD Inspector General. In April 2014, the DOD Inspector General found that the Naval Supply Systems Command's procedures do not require supply planners to comprehensively review no-demand items to ensure that they support valid requirements, which resulted in the Naval Supply Systems Command paying storage costs for items no longer needed.<sup>1</sup> Specifically, the DOD Inspector General recommended that Naval Supply Systems Command develop and implement procedures to clarify requirements related to the review of no-demand items and develop a phased approach, with milestones, for reviewing all no-demand items. As of February 2015, the Naval Supply Systems Command is in the process of establishing a policy for no-demand items and a plan of actions and milestones to review all no-demand items. Through its approach, Naval Supply Systems Command plans to collaborate with key stakeholders, such as Naval Sea Systems Command, Naval Air Systems Command, and Naval Warfare Systems Command, in its review of no-demand items to ensure that only items with valid requirements are retained. Lastly, Naval Supply Systems Command plans to establish routine processes, such as an annual process to validate the retention of no-demand items, to help ensure a sustained focus on the issue.

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<sup>1</sup>DOD Inspector General, *Navy Can Improve Management of Zero-Demand Items*, DODIG-2014-063 (Apr. 25, 2014). The DOD Inspector General focused on items with no demand for 5 or more years.

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## Air Force Efforts Focus on Improving Cost- Effectiveness of Its Inventory Management Processes

Over the last several years, the Air Force has focused on two broad improvement efforts that are intended to improve the cost-effectiveness of inventory management operations. First, in February 2013, the Air Force began an effort called the “War on Excess,” which is focused on reducing excess inventory and dormant stock (i.e., items without demand).<sup>2</sup> Headquarters Air Force and Air Force Materiel Command formed a number of teams and identified actions to address specific inventory management issues, such as teams reviewing and reducing dormant stock and excess inventory and reviewing the materiel disposal process. According to Air Force officials, these efforts have assisted in reducing excess inventory and improving the service’s inventory management. For example, the Air Force’s effort to reduce its dormant stock has resulted in a reduction of excess inventory with 10 or more years of no demand by about \$430 million from March 2013 through March 2014. The Air Force continues to monitor its efforts associated with the “War on Excess” through regular progress reviews.

Second, the Air Force Sustainment Center, shortly after its creation in July 2012, issued its strategy plan, which is aimed in part at increasing the focus on cost factors associated with readiness (i.e., cost-effectiveness readiness). Through the creation of the Air Force Sustainment Center, numerous supply chain entities and functions were merged together, providing the opportunity to standardize business practices and adopt guiding operating principles. In fiscal year 2013, the Air Force Sustainment Center began an initiative, referred to as the “Road to \$1 Billion,” to focus the center’s efforts on becoming more cost-effective, including identifying verifiable cost savings and cost avoidance improvement actions. Air Force Sustainment Center officials noted that, based on their analysis, four inventory-related projects, such as determining cost savings from demand forecast accuracy improvements and reductions in item purchase price or acquisition lead times, have produced savings of \$572 million through the end of fiscal year 2014.

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<sup>2</sup>Dormant stock, as defined by the Air Force, is an item that has not had a demand in 10 or more years.

# Appendix IV: Value of the Services' On-Order and On-Order Excess Inventory

The services track and report the amount of on-order and on-order excess inventory. On-order inventory are items that are not in the services' possession but for which a contract has been awarded or funds have been obligated, whereas on-order excess inventory are items for which a contract has been awarded or funds have been obligated, but due to subsequent changes in requirements would be categorized upon delivery as economic retention stock, contingency retention stock, or potential reutilization stock. On-order excess inventory that is not able to be modified or canceled and is taken into the services' possession is not necessarily disposed of. Rather, the inventory may be categorized as economic retention stock or contingency retention stock and potentially used in the future.

In 2014, the Office of the Secretary of Defense began reviewing how the amount of on-order excess inventory would be distributed among the categories above the approved acquisition objective. According to the Office of the Secretary of Defense officials, this more detailed review of on-order excess inventory provides better visibility and understanding of the on-order excess inventory. See table 7 for the services' value of on-order and on-order excess inventory for fiscal years 2012 through 2014.

**Table 7: The Services' Value of On-Order and On-Order Excess Inventory, 2012–2014**

Nominal dollars in millions

Service	End of fiscal year 2012			End of fiscal year 2013			Midpoint fiscal year 2014		
	Total value of on-order inventory	Total value of on-order excess inventory	Percentage of on-order excess inventory	Total value of on-order inventory	Total value of on-order excess inventory	Percentage of on-order excess inventory	Total value of on-order inventory	Total value of on-order excess inventory	Percentage of on-order excess inventory
Army <sup>a</sup>	\$3,232.0	\$255.0	7.9%	\$1,903.0	\$234.1	12.3%	\$1,289.0	\$235.8	18.3%
Navy	— <sup>b</sup>	— <sup>b</sup>	— <sup>b</sup>	— <sup>b</sup>	— <sup>b</sup>	— <sup>b</sup>	1,799.0	184.8	10.3
Air Force	1,927.0	88.0	4.6%	1,798.0	164.0	9.1%	1,546.0	104.0	6.7

Source: GAO analysis of Army, Navy, and Air Force data. | GAO-15-350

Notes: The services track on-order excess inventory, which are items for which a contract has been awarded or funds have been obligated, but due to subsequent changes in requirements would be categorized upon delivery as economic retention stock, contingency retention stock, or potential reutilization stock.

<sup>a</sup>The Army figures are those that it reported, but these percentages are likely underreported due to the Army overstating its approved acquisition objective as previously discussed, which results in the amount of the on-order excess inventory likely being understated.

<sup>b</sup>The Navy could not extract reliable and accurate on-order inventory and on-order excess inventory amounts and percentages due to complications associated with the implementation of its enterprise resource planning system.

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# Appendix V: Actions Taken by the Services to Reduce Backorders

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Although backorder reduction goals are not established in the Department of Defense (DOD) *Comprehensive Inventory Management Improvement Plan*, the Army, Navy, and Air Force have their own measures and processes for tracking backorders and have generally made progress reducing their backorders. The Army measures its progress reducing backorders by tracking the dollar value of backorders, whereas the Navy focuses on reducing the number of backorders. The Air Force monitors the number of backorders as well as parts shortages that cause severe delays to repairs of mission-critical systems. Each service regularly reviews backorder data as a part of its inventory management oversight processes.

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## The Army Slightly Decreased Its Backorders and Has Established a Goal for Decreasing Backorders

In March 2013, the Army established a goal to reduce the dollar value of backorders by 30 percent—or roughly \$165 million—by the end of September 2014, but did not meet its goal.<sup>1</sup> Specifically, according to September 2014 data, the Army saw about a \$45 million decrease in the total value of backorders, which is approximately an 8 percent reduction. Though the overall reduction in the dollar value of backorders slightly decreased, some of the Army's life-cycle management commands were more successful in reducing backorders than others. For example, the Aviation and Missile Life Cycle Management Command reduced the dollar value of its backorders by nearly 50 percent, while the Tank-automotive and Armaments Life Cycle Management Command saw an increase of nearly 40 percent.

Alongside these differences, however, the Army has decreased the instances of backorders that result in a weapon system remaining or becoming not mission capable due to a missing part, also referred to as Not Mission Capable for Reasons of Supply. According to the Army and DOD, these backorders are among the most critical since they result in a nonfunctioning weapon system and can hold up the repair process if not corrected. In the last year, the Army has reduced its Not Mission Capable for Reasons of Supply backorders as a percentage of total backorders by over a third, while still generally maintaining its stock availability rates above its goal of 85 percent.

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<sup>1</sup>The Army's backorder goal was measured by dollar amount in order to help quantify the significance of the backorders.

The Army monitors backorders by holding monthly reviews through the Sales and Operations Planning structure.<sup>2</sup> The monthly reviews of backorders are conducted by the weapon system organizations, the life-cycle management commands, and Army Materiel Command. During these meetings, the Army looks at the number of different items backordered and progress made by the life-cycle management commands towards meeting the 30 percent reduction goal, as well as the age of backorders in different categories such as ground combat systems or aviation systems.

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## The Navy Has Reduced Total Backorders, but Some Maritime Backorders Are Increasing

The Navy reduced total backorders by 6 percent—or about 2,600 backorders—from June 2012 through June 2014, but experienced a 41 percent increase in maritime mission-critical supply shortages during the same period.<sup>3</sup> Specifically, the Navy's mission-critical supply shortages—those shortages that affect a ship's ability to support its required mission areas and mission-essential equipment—increased from about 1,100 to 1,550 between June 2012 and June 2014. Navy officials told us that the drivers of the increase in mission-critical supply shortages include

- inattention to customer orders, which were increasing while a long-term contract for certain mission critical parts was expiring;
- a hiring freeze coupled with retirements that resulted in a knowledge gap within the supply planner community, affecting the service's management of backorders;
- after the hiring freezes ended there was a lack of experience among newly hired maritime supply planners managing maritime parts; and
- an October 2013 reorganization within the maritime supply chain side of Navy inventory management.

Naval Supply Systems Command Weapon Systems Support officials stated that they are aware of the increase in maritime-related mission-critical supply shortages and cited several efforts to improve its performance. Specifically, the command has begun an effort to improve its performance by focusing on those maritime items with the highest demand. In addition, the Navy is conducting weekly reviews of

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<sup>2</sup>We provide details on the Army's Sales and Operations Planning process in app. III.

<sup>3</sup>The Navy refers to a maritime mission-critical supply shortage as a casualty report. A casualty report documents an instance in which a maritime-related system is nonmission capable due to a weapon system not being able to perform its mission until a critical replacement part is provided to maintenance to repair the weapon system.

backorders older than 180 days by mid- and upper-level management; implementing different inventory management planning factors, such as changing the amount of time used by the Navy in determining the procurement quantity for a spare part; and implementing monthly meetings at the senior-executive level beginning in June 2014 to examine mission-critical supply shortages by volume and age.<sup>4</sup> Further, to close the knowledge gap, the Navy began rolling out additional training across all its Integrated Weapon System Teams in May 2014, as well as assigning supervisors the role of “superleads” to assist new hires in becoming more familiar and more proficient with their supply planner responsibilities.

Naval Supply Systems Command Weapon Systems Support monitors total backorders and mission-critical supply shortages against goals that are established across each fiscal year based on analysis of past performance. The specific goals vary by organization and weapon system type. In addition, the Navy monitors other metrics associated with backorders, such as stock material availability rates.<sup>5</sup> Each month, the Navy holds backorder briefings where officials examine backorders by grouping them in different categories, including, among others, consumables versus reparables, items in backorder status over 180 days, and top 20 items in backorder status. These backorder briefings include a description of the backordered item with the reasons for the lack of availability, steps being taken to mitigate the issue, and when the item is expected to no longer be in backorder status. The Integrated Weapon System Teams also brief Naval Supply Systems Command at least once a year on backorder items and actions being taken to mitigate and resolve high-dollar-value backorders across the team’s weapon systems.

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<sup>4</sup>Coverage duration is the length of time used by the Navy to determine the amount of an item to procure when there is a decision to procure. Previously, the Navy coverage duration was 6 months. The Navy has changed its coverage duration to 12 months. This increase in time protects against demand variability and reduces the amount of procurements to help alleviate backlogs in the contracting office.

<sup>5</sup>The stock material availability metric measures the fill rate of customer orders.

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## The Air Force Has Reduced Backorders in Recent Years

The Air Force has reduced its total number of backorders by approximately 33,000 in the 3- year period from June 2011 through June 2014, a decline of approximately 31 percent.<sup>6</sup> Additionally, the Air Force has made a small reduction in the kinds of parts shortages that cause severe delays to repairs of its mission-critical systems—known as Mission Impaired Capability Awaiting Parts (MICAP). As with the other services' similar categories, MICAP reflects high-priority items in backorder status that result in a weapon system or end item being inoperable. According to officials, this shortage is measured in nonavailability hours for the weapon system or end item. Air Force data show that the number of MICAP hours for depot repairs has generally decreased since the beginning of fiscal year 2010, while MICAP hours for field repairs—which make up 82 percent or more of the total MICAP hours each month—decreased from 4.03 million hours in October 2009 to 3.36 million in June 2014.<sup>7</sup>

Air Force officials informed us that backorder data are tracked by the Air Force Sustainment Center's 448th Supply Chain Management Wing, while higher-level commands—such as Air Force Materiel Command and Air Force Sustainment Command—are primarily concerned with tracking MICAP hours, due to their effect on the readiness of Air Force systems.<sup>8</sup> According to an Air Force Sustainment Center official with responsibility for this area, the Air Force Sustainment Center stopped monitoring backorders in favor of using metrics that were more focused on lead times and response time, such as the time required to fill an order. The officials stated that the use of order response time metrics, for example, helps to reduce the occurrence of the most serious backorders, MICAPs.

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<sup>6</sup>From October 2009 through August 2014, the Air Force reduced its backorders from a high of approximately 114,000 in October 2010 to a low of approximately 52,000 in December 2013.

<sup>7</sup>Depot repairs generally refer to major maintenance actions, such as those at the Air Force's three air logistics complexes, whereas field repairs are generally less complex maintenance actions occurring at unit maintenance facilities.

<sup>8</sup>The Air Force's 448th Supply Chain Management Wing is a subordinate organization of the Air Force Sustainment Center. Among other things, according to Air Force officials, the organization is responsible for handling the day-to-day management of Air Force inventory items, to include decisions on purchasing, retention, and disposal made by the wing's item managers.

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# Appendix VI: The Services Have Efforts Focused on Improving and Monitoring Demand Forecasting

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Each of the services has efforts focused on improving and monitoring demand forecasting. The services have taken different approaches targeted at unique needs, and their efforts are in various stage of implementation, as described below:

**Army:** In July 2014, Army Materiel Command issued a Demand Planning Implementation Plan to guide its improvements in demand forecasting. Army Materiel Command's overall goal for the plan is to improve demand forecast accuracy through more effective demand planning and the development of demand forecasting metrics. Army Materiel Command identified three principal weaknesses affecting forecast accuracy. First, item managers currently perform demand planning largely based on historical information, which may not account for future effects on demand (e.g., drawdown, funding limitations). Second, the Army determined that there are few, if any, policies guiding demand planning across the Army. Third, the current planning culture is focused on materiel availability with less focus on cost, often resulting in excess procurement. The Army's plan identifies key action steps that are intended to address these weaknesses. For example, the plan includes developing and incorporating demand planning metrics into the Army's Sales and Operations Planning process, which was rolled out in January 2013.<sup>1</sup> In addition, the plan indicates there will be planning events with an increased emphasis on frequent and open communication between operational and financial planning communities to institutionalize forward-looking demand planning processes. The implementation plan identifies milestones through the end of fiscal year 2015 and directs a process to assign roles and responsibilities for core personnel representing Army Materiel Command, its life-cycle management commands, and weapon systems. The plan states there are strong cultural issues to overcome and the need for a sustainable process for solutions to be adopted. In addition to these efforts, the Army Materiel Command began to evaluate

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<sup>1</sup>Details of the Army's Sales and Operations Planning process can be found in app. III.

establishing inventory-level-setting policies for items with infrequent or highly variable demand in July 2014 with results due in early 2015.<sup>2</sup>

**Navy:** Naval Supply Systems Command is reviewing and analyzing its demand forecasting processes and planning factors to make improvements. The command's goal is to improve performance on the Department of Defense's forecast accuracy and bias metrics tracked across the department. Naval Supply Systems Command's key milestone is reporting available results from its analyses and planned actions to the Office of the Secretary of Defense in March 2015 as a part of its semiannual briefing on its inventory management metrics and improvement efforts. To monitor progress, Naval Supply Systems Command Weapon Systems Support holds a biweekly progress review of demand forecasting improvement efforts, according to officials, and briefs Naval Supply Systems Command regularly as part of its performance management meeting focused on the implementation of efforts associated with the *Comprehensive Inventory Management Improvement Plan*.

As a part of its effort, the Navy is exploring changes to its forecast methodology and the number of quarters used to compute the forecast, and segmenting inventory items into demand categories—high, medium, and low demand—to analyze potential differences in demand forecast accuracy across the segments.<sup>3</sup> It is also reviewing the effect of supply planners' manually overriding demand forecasts generated by the Navy's enterprise resource planning system and evaluating the effect of the time

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<sup>2</sup>The Defense Logistics Agency has already begun to manage approximately 495,000 consumable items with low or highly variable demand through an alternative approach since traditional forecasting methods were ineffective. However, the Army's efforts are focused on repairable items that have infrequent or highly variable demand and this focus introduces additional complexity since repairable items can be repaired, according to officials. Thus, the Defense Logistics Agency's processes used for consumable items are not directly transferable to repairable items. See [GAO-14-495](#) for additional information on the Defense Logistics Agency's approach.

<sup>3</sup>Naval Supply Systems Command largely uses exponential smoothing with a backcasting technique to forecast demand for its items on a quarterly basis. Backcasting refers to the technique of exponentially smoothing back to the earliest quarter of demand to find what the forecast would have been at that time and then starting with that forecast and exponentially smoothing forward through all quarters. Naval Supply Systems Command generally uses 5 years of demand history to detect long-term trends in demand, but the number of years of demand history used can be altered if necessary, such as in cases of peak demand.

horizon used in computing the forecast accuracy metrics. With respect to the time horizon used in computing forecast accuracy, Naval Supply Systems Command Weapon Systems Support's analysis shows that its demand forecast accuracy improves when evaluated over a 2-year period rather than a 1-year period (i.e., the current time frame used for the department-wide forecast accuracy metrics). According to Naval Supply Systems Command officials, the improved performance over the longer time frame is attributable to the fact that Naval Supply Systems Command Weapon Systems Support manages a considerable number of low-demand items, especially maritime items. Overall, Naval Supply Systems Command's review and analysis of potential changes remain in progress as of January 2015 and specific actions are yet to be determined, according to Navy officials.

**Air Force:** Air Force Materiel Command has been conducting forecast accuracy improvement efforts since 2008 and has institutionalized the demand forecast accuracy metric throughout the 448th Supply Chain Management Wing since 2009. The Air Force has a number of initiatives geared toward improving demand forecasting. The Air Force Sustainment Center tracks the progress toward milestones in most of their initiatives as part of its effort to achieve an overall goal of 75 percent demand forecast accuracy. For example, a key Air Force Sustainment Center initiative is its ongoing effort to review 200 items every quarter with personnel who provide key inputs into setting demand forecasts.<sup>4</sup> As a part of this effort, the Air Force assembled a team, consisting in part of key demand planning personnel at Hill, Tinker, and Robins Air Force bases, to continuously conduct quarterly reviews. Results from these reviews are reported to the leadership of the 448th Supply Chain Management Wing, and officials have stated that these reviews have assisted in driving continuous demand forecasting improvements. Additionally, the Air Force Materiel Command is in the process of implementing actions to reduce variability in the flying hour program used to set Air Force demand plans, according to officials. The Air Force is also taking steps to develop inventory-level-setting policies for items with infrequent or highly variable

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<sup>4</sup>According to Air Force officials, the items selected for review change over time. For example, the Air Force has previously selected the two "top" items for each equipment specialist. It has also previously selected items with low demand forecast accuracy and those that were outliers from standard deviations. According to officials, root cause analysis is performed on the selected items to extrapolate lessons for future demand forecasting.

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**Appendix VI: The Services Have Efforts  
Focused on Improving and Monitoring Demand  
Forecasting**

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demand. The Air Force is also taking steps to develop inventory-level-setting policies for items with infrequent or highly variable demand. With respect to the inventory-level-setting policies for items with infrequent and highly variable demand, the Air Force has established key milestones for the implementation of this effort that run into June 2015.

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# Appendix VII: The Services Have Efforts Focused on Improving and Monitoring Acquisition Lead Times

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Each of the services has efforts focused on improving and monitoring acquisition lead times. The services have taken different approaches targeted at unique needs, and their efforts are in various stage of implementation, as described below:

**Army:** Army Materiel Command is monitoring the accuracy of lead times and establishing action steps and milestones to improve the accuracy of acquisition lead times. Specifically, the Army has institutionalized processes for the management of lead times and began an effort in June 2014 that is evaluating ways to improve the Army's supply planning process, including evaluating its supply planning factors, such as acquisition lead times. First, Army Materiel Command and its life-cycle management commands have created a checklist for item managers to use in validating and monitoring administrative and production lead times accuracy. Second, the Army Materiel Command chartered an Integrated Project Team, with members from across the life-cycle management commands, in June 2014. The Integrated Project Team's goal is to develop a standardized, forward-looking process to ensure the supply plan, including lead time planning factors, is adequate to meet forecasts without adding to excess inventory levels. The Integrated Project Team charter included action steps and milestones with the next major deliverable—a supply planning implementation plan—due in February 2015. Officials stated that this initiative, along with ongoing efforts established in policy and practice at the weapons systems level, is expected to improve the management and accuracy of acquisition lead times across the Army.

**Navy:** Naval Supply Systems Command has taken actions to improve the accuracy of acquisition lead times. To monitor progress, Naval Supply Systems Command Weapon Systems Support holds a biweekly progress review of lead time efforts, according to officials, and briefs Naval Supply Systems Command monthly as part of the latter's performance management meeting focused on the implementation of efforts associated with the *Comprehensive Inventory Management Improvement Plan*. The Navy's efforts have largely focused on improving the accuracy of administrative lead times, and the Navy is in the process of generating actions to address production lead times.

On an annual basis, Naval Supply Systems Command Weapon Systems Support conducts a study to update administrative lead time values across aviation and maritime items. Additionally, the Navy has two efforts underway to improve the accuracy of administrative lead times. First, in an effort to improve its performance across a number of inventory

metrics, in the summer of 2014, Naval Supply Systems Command Weapon Systems Support segmented its maritime items based on the amount of demands received on an item and began to manage the segment of items with the greatest demand—those items with greater than 55 demands from October 2011 through September 2013—using unique planning factors. As a result of this management approach, Naval Supply Systems Command has updated the administrative lead times for these items to reflect the priority given to these items in the contracting process. Naval Supply Systems Command Weapon Systems Support is monitoring this management approach for these maritime items and plans to evaluate this approach in early fiscal year 2016 to determine whether the segmented approach should be expanded to the remainder of the maritime items as well as aviation items. Second, Naval Supply Systems Command Weapon Systems Support is reevaluating the methodology used in calculating administrative lead times for the remainder of the maritime items and all of its aviation items, with the plan of implementing updated administrative lead times for these items once the evaluation is complete.

**Air Force:** The Air Force Sustainment Center has institutionalized several processes that are designed to continually improve the management of acquisition lead times. Also, the Air Force has enhanced its monitoring of lead time metrics and reemphasized policy and practices that assist in ensuring lead time accuracy. First, the Air Force Sustainment Center regularly monitors and analyzes Air Force performance trends on the department-wide acquisition lead time variance metric against the Department of Defense goal of an average variance of +/-30 days. In addition, the 448th Supply Chain Management Wing has established a broader set of metrics, including assessing the number of days for lead times against goals, as of early fiscal year 2015.

Second, as a part of the Air Force's effort to improve lead time performance in support of the *Comprehensive Inventory Management Improvement Plan*, the 448th Supply Chain Management Wing reemphasized its inventory planning policy and practices, reminding wing supply planners to (1) update the lead time of record with the last actual lead time unless there are documented reasons for not updating the lead time of record; (2) adjust lead times as needed based on information not in the data system, such as entering a new production lead time from a newly signed contract, or updating the lead time of record with a new lead

time once at least 10 percent of items from the latest order have been delivered; and (3) revert any lead time without an observed lead time over 5 years to a standard lead time.<sup>1</sup>

Third, the 448th Supply Chain Management Wing is working through broader Air Force efforts, such as the Strategic Commodity Sourcing and the Supplier Relationship Management programs, to reduce acquisition lead times through establishing long-term contracts to obtain parts. The use of long-term contracts can reduce administrative lead times because negotiation for a new contract is not needed every year or for every procurement action. Also, long-term contracts can result in reduced production lead times. For example, through the Supplier Relationship Management program the Air Force reviews the Air Force's top 10 suppliers, in terms of dollars, for opportunities to reduce production lead time. The Air Forces' Strategic Commodity Sourcing program has reported savings of \$124 million related to inventory procurements during fiscal years 2012 and 2013.

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<sup>1</sup>According to officials, the Air Force uses a standard lead time of 50 days for items that it has not ordered in more than 5 years or that are being provided by a new supplier.

# Appendix VIII: Comments from the Department of Defense



LOGISTICS AND  
MATERIEL READINESS

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

APR 6 2015

Ms. Zina D. Merritt  
Director, Defense Capabilities and Management  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

Dear Ms. Merritt:

This is the Department of Defense (DoD) response to the GAO Draft Report, GAO-15-350 "DEFENSE INVENTORY: Services Generally Have Reduced Excess Inventory, but Additional Actions Needed," dated March 6, 2015 (GAO Audit Codes 351870, 351923, 351912, & 352011). Detailed comments on the report recommendations are enclosed.

Sincerely,

A handwritten signature in black ink, appearing to read "David J. Berteau".

David J. Berteau

Enclosure:  
As stated

GAO Draft Report Dated March 6, 2015  
GAO-15-350 (GAO AUDIT CODES 351870, 351923, 351912, & 352011)

“DEFENSE INVENTORY: SERVICES GENERALLY HAVE REDUCED EXCESS  
INVENTORY, BUT ADDITIONAL ACTIONS NEEDED,”

DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATION

**RECOMMENDATION 1:** To help ensure that the Army calculates its requirements for spare parts in accordance with Army guidance, and that OSD has accurate information to manage and oversee the Department’s progress in reducing on-hand excess inventory, the Government Accountability Office (GAO) recommends the Secretary of the Army direct the Commander, Army Materiel Command to correct its calculation of the approved acquisition objective to include 2 years of demand data, as officials state the Army is taking steps to do.

**DoD RESPONSE:** Concur: The Secretary of the Army will direct the Commander, Army Materiel Command to correct its calculation of the approved acquisition objective to include 2 years of demand data. The approved acquisition objective calculation using 2 years of demand data will be incorporated into the Army Materiel Command Supply Chain Planning Reporting Tool (SCPRT). Estimated implementation date is 3QFY16.

**RECOMMENDATION 2:** To balance DoD’s continuing efforts to gather and report data on its contractor-managed inventory with ensuring the accuracy of its metric used to measure progress reducing on-hand excess inventory, the GAO recommends that the Secretary of Defense direct the Assistant Secretary of Defense for Logistics and Materiel Readiness, in conjunction with the services, to exclude contractor-managed spare parts from calculations of the percentage of on-hand excess inventory.

**DoD RESPONSE:** Concur: The Assistant Secretary of Defense for Logistics and Materiel Readiness, in conjunction with the services, will exclude contractor-managed spare parts from calculations of the percentage of on-hand excess inventory beginning in 3QFY15. In addition, DoD Manual 4140.01, Volume 10 will be updated to reflect the change in the excess on-hand percentage calculation by 4QFY16.

**RECOMMENDATION 3:** To help ensure that the Army has established appropriate goals to guide improved performance, in accordance with federal standards for internal control, the GAO recommends the Secretary of Army direct the Commander, Army Materiel Command to reassess its on-hand inventory reduction goal based on analysis of corrected Army inventory stratification data and other relevant inventory factors such as inventory returning from overseas operations, and revise the goal, as necessary, based on the results of the analysis.

**DoD RESPONSE:** Concur: The Secretary of the Army will direct the Commander, Army Materiel Command to reassess its on-hand inventory reduction goals based on data analysis. Army Materiel Command is implementing new measures for ongoing performance of inventory

management actions against the new calculated reduction goals in the monthly Sales and Operations Planning (S&OP) process. Estimated completion date is 3QFY15.

**RECOMMENDATION 4:** To help ensure that the Air Force is properly retaining items and accurately reporting its amount of retention stock and excess inventory in accordance with DoD guidance, and not spending resources to store unneeded inventory, the GAO recommends that the Secretary of the Air Force direct that the Commander, Air Force Materiel Command begin performing contingency retention reviews for those items, valued at about \$2.6 billion, that it already knows should not be retained as economic retention stock so that it can identify and promptly dispose of inventory that is not needed.

**DoD RESPONSE:** Concur: The Secretary of the Air Force will direct the Commander, Air Force Materiel Command to begin performing contingency retention reviews for those items that should not be retained as economic retention stock in order to identify and promptly dispose of inventory that is not needed. Air Force Materiel Command will begin performing contingency retention reviews in May 2015 with an estimated completion date of 1QFY16.

**RECOMMENDATION 5:** To improve management and minimize the amount of on-order excess inventory in accordance with DoD's on-order excess inventory reduction goal, and to be consistent with federal standards for internal control and leading practices for results-oriented management, the GAO recommends the Secretary of the Army direct the Commander, Army Materiel Command to develop life cycle management command-specific goals for the reduction of on-order excess inventory and monitor these goals.

**DoD RESPONSE:** Concur: The Secretary of the Army will direct the Commander, Army Materiel Command to develop life cycle management command (LCMC) specific on-order excess goals and monitor these goals. Army Materiel Command will review progress against the LCMC specific on-order goals during the monthly S&OP process. Estimated completion date is 3QFY15.

**RECOMMENDATION 6:** To help ensure that the Navy has adequate oversight of on-order excess inventory termination decisions and necessary performance measures consistent with DoD guidance, the GAO recommends that the Secretary of the Navy direct the Commander, Naval Supply Systems Command to incorporate graduated management reviews based on dollar value thresholds into its current on-order excess inventory termination practices.

**DoD RESPONSE:** Concur: The Secretary of the Navy will direct the Commander, Naval Supply Systems Command to incorporate dollar value approval thresholds in its on-order excess review process. The inventory management review process will ensure graduated levels of approval are tracked and documented with regard to on-order excess. Estimated completion date for corrective action is 4QFY15.

**RECOMMENDATION 7:** To help ensure that the Navy has adequate oversight of on-order excess inventory termination decisions and necessary performance measures consistent with DoD guidance, the GAO recommends that the Secretary of the Navy direct Commander, Naval Supply Systems Command to incorporate the graduated management reviews and ability to track

and review the reasons for not cancelling and modifying on-order excess items into its automated termination module that is under development.

**DoD RESPONSE:** Concur: The Secretary of the Navy will direct Commander, Naval Supply Systems Command to continue development of the Navy ERP automated termination module to include graduated management approval as well as the use and tracking of reason codes for not cancelling or modifying on-order excess. Estimated completion date for implementation is 1QFY19.

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# Appendix IX: GAO Contact and Staff Acknowledgments

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## GAO Contact

Zina D. Merritt, (202) 512-5257 or [merritz@gao.gov](mailto:merritz@gao.gov)

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## Staff Acknowledgments

In addition to the individual named above, key contributors to this report were Tom Gosling (Assistant Director); Suzanne Wren (Assistant Director); John Bumgarner; Richard Burkard; William Cordrey; Elizabeth Curda; Michael Holland; Dave Hubbell; Cale Jones; James Lackey; Steve Pruitt; Janine Prybyla; Greg Pugnetti; Matt Sakrekoff; Michael Silver; Anne Stevens; Sabrina Streagle; John E. Trubey; Erik Wilkins-McKee; Ed Yuen; and Delia Zee.

# Appendix X: Accessible Data

**Data Table for Figure 1: Navy On-Hand Excess Inventory, 2012–2014 (Nominal Dollars in Billions)**

<b>Date</b>	<b>Total inventory value including contractor - managed</b>	<b>Total inventory value excluding contractor - managed</b>
Sept. 2012	10.7	13.1
Sept. 2013	8.9	10.9
Mar. 2014	5.1	6.4

**Data Table for Figure 2: Air Force On-Hand Excess Inventory, 2010–2014 (Nominal Dollars in Billions)**

<b>Date</b>	<b>Total inventory value including contractor - managed</b>	<b>Total inventory value excluding contractor - managed</b>
Sept. 2010	7.7	8.7
Sept. 2011	6.3	7.2
Sept. 2012	3.6	4.3
Sept. 2013	6.5	8.5
Mar. 2014	4.3	5.8

**Data Table for Figure 3: Demand Forecast Accuracy Performance by Service**

<b>Service</b>	<b>Percent forecast accuracy for Sept. 2013</b>	<b>Percent forecast accuracy for March 2014</b>
Army	10.7	32
Navy	49.2	50.1
Air Force	64	61.7

**Data Table for Figure 4: Demand Forecast Bias by Service**

<b>Service</b>	<b>Percent forecast accuracy for Sept. 2013</b>	<b>Percent forecast accuracy for March 2014</b>
Army	42.1	36.4
Navy	14.2	15.1
Air Force	10.1	-4.7

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**Data for Figure 5: Overview of Army Sales and Operations Planning Meetings and Process**

1. Circular Flow chart:
2. Product Management Review
3. Demand Review
4. Supply Review
5. Integrated Reconciliation Review
6. Management Business Review (then back to 1)

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# Related GAO Products

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*High-Risk Series: An Update.* [GAO-15-290](#). Washington, D.C.: February 11, 2015.

*Defense Inventory: Actions Needed to Improve the Defense Logistics Agency's Inventory Management.* [GAO-14-495](#). Washington, D.C.: June 19, 2014.

*High-Risk Series: An Update.* [GAO-13-283](#). Washington, D.C.: February 14, 2013.

*Defense Inventory: Actions Underway to Implement Improvement Plan, but Steps Needed to Enhance Efforts.* [GAO-12-493](#). Washington, D.C.: May 3, 2012.

*Defense Logistics: DOD Needs to Take Additional Actions to Address Challenges in Supply Chain Management.* [GAO-11-569](#). Washington, D.C.: July 28, 2011.

*Opportunities to Reduce Potential Duplication in Government Programs, Save Tax Dollars, and Enhance Revenue.* [GAO-11-318SP](#). Washington, D.C.: March 1, 2011.

*High-Risk Series: An Update.* [GAO-11-278](#). Washington, D.C.: February 2011.

*DOD's 2010 Comprehensive Inventory Management Improvement Plan Addressed Statutory Requirements, But Faces Implementation Challenges.* [GAO-11-240R](#). Washington, D.C.: January 7, 2011.

*DOD's High-Risk Areas: Observations on DOD's Progress and Challenges in Strategic Planning for Supply Chain Management.* [GAO-10-929T](#). Washington, D.C.: July 27, 2010.

*Defense Inventory: Defense Logistics Agency Needs to Expand on Efforts to More Effectively Manage Spare Parts.* [GAO-10-469](#). Washington, D.C.: May 11, 2010.

*High-Risk Series: An Update.* [GAO-09-271](#). Washington, D.C.: January 2009.

*Defense Inventory: Army Needs to Evaluate Impact of Recent Actions to Improve Demand Forecasts for Spare Parts.* [GAO-09-199](#). Washington, D.C.: January 12, 2009.

*Defense Logistics: Lack of Key Information May Impede DOD's Ability to Improve Supply Chain Management.* [GAO-09-150](#). Washington D.C.: January 12, 2009.

*Defense Inventory: Management Actions Needed to Improve the Cost Efficiency of the Navy's Spare Parts Inventory.* [GAO-09-103](#). Washington, D.C.: December 12, 2008.

*DOD's High-Risk Areas: Efforts to Improve Supply Chain Can Be Enhanced by Linkage to Outcomes, Progress in Transforming Business Operations, and Reexamination of Logistics Governance and Strategy.* [GAO-07-1064T](#). Washington, D.C.: July 10, 2007.

*Defense Inventory: Opportunities Exist to Save Billions by Reducing Air Force's Unneeded Spare Parts Inventory.* [GAO-07-232](#). Washington, D.C.: April 27, 2007.

*Defense Inventory: Opportunities Exist to Improve the Management of DOD's Acquisition Lead Times for Spare Parts.* [GAO-07-281](#). Washington, D.C.: March 2, 2007.

*High-Risk Series: An Update.* [GAO-07-310](#). Washington, D.C.: January 2007.

*DOD's High-Risk Areas: Progress Made Implementing Supply Chain Management Recommendations, but Full Extent of Improvement Unknown.* [GAO-07-234](#). Washington, D.C.: January 17, 2007.

*DOD's High-Risk Areas: Challenges Remain to Achieving and Demonstrating Progress in Supply Chain Management.* [GAO-06-983T](#). Washington, D.C.: July 25, 2006.

*Defense Inventory: Actions Needed to Improve Inventory Retention Management.* [GAO-06-512](#). Washington, D.C.: May 25, 2006.

*High-Risk Series: An Update.* [GAO-05-207](#). Washington, D.C.: January 2005.

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