



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

June 2014

DEFENSE INVENTORY

Actions Needed to Improve the Defense Logistics Agency's Inventory Management

GAO Highlights

Highlights of [GAO-14-495](#), a report to the Subcommittee on Readiness, Committee on Armed Services, House of Representatives

Why GAO Did This Study

DLA manages about one-fifth of DOD's \$95 billion in secondary item inventory, such as spare parts to keep military equipment ready and operating. GAO has identified DOD supply-chain management as a high-risk area due in part to ineffective and inefficient inventory-management practices and weaknesses in forecasting the demand for spare parts. These factors have contributed to the creation of on-order and on-hand excess inventory.

GAO was asked to review DLA's inventory-management practices. GAO reviewed, among other things, the extent to which DLA has (1) developed and met goals to reduce on-hand inventory and on-order excess inventory while reducing backorders, and any challenges faced in doing so, and (2) implemented initiatives using a comprehensive management approach to improve inventory management. GAO analyzed inventory data from 2009 through 2013, evaluated DLA's inventory processes, and interviewed DLA and DOD officials.

What GAO Recommends

GAO is making multiple recommendations designed to strengthen inventory management, including that DLA reassess its inventory-reduction goals and schedule for achieving them based on DLA's economic analyses; regularly monitor its progress in reducing on-order excess inventory; establish supply chain-specific on-order excess inventory goals; and take steps to improve its collaborative forecasting, such as regularly monitoring performance. DOD concurs with GAO's recommendations.

View [GAO-14-495](#). For more information, contact Zina Merritt at (202) 512-5257 or merrittz@gao.gov

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What GAO Found

The Defense Logistics Agency (DLA) developed and met goals for reducing on-hand inventory and on-order excess inventory (i.e., already purchased items that may be excess due to subsequent changes in the services' requirements) and has made progress towards its goals for reducing backorders (shortages of spare parts), but challenges remain. DLA disposed of \$4 billion in items for a net reduction of \$2.5 billion to its on-hand inventory after continued replenishments to achieve its fiscal year 2013 goal of \$11.7 billion. DLA used a risk-based approach to identify items to be disposed, resulting, for example, in a reduction of about \$657 million in items with no demand in 5 years. Also, DLA has reduced on-order excess inventory from 6.7 percent of the total value of on-order inventory in 2011 to 5.6 percent in 2013, which is progress toward the Department of Defense's (DOD) 4 percent goal by the end of fiscal year 2016. DLA has also reduced backorders by nearly 30 percent through monthly reviews. However, some challenges remain.

On-hand inventory: To meet its fiscal year 2013 goal, DLA disposed of \$855 million in items that DLA's economic analyses determined should be kept due to the risk DLA will need to buy the same items again in the future. The DLA Director stated that he was willing to accept the risk of needing to rebuy some inventory to reduce DLA's on-hand inventory. According to DLA's analysis, it will likely need to dispose of about \$1.9 billion more in economic retention stock to meet its \$10 billion goal for fiscal year 2014, increasing the likelihood of buying the same items again to meet future requirements. DOD guidance states that an economic analysis that balances the likelihood of repurchase with the cost of retention and disposal should guide retention decisions. In 2012, DLA estimated that it would have had to buy 42 percent of the dollar value of the items again over a 5-year period if it had disposed of all its economic retention stock. Without reassessing its goals and schedule for achieving them, DLA risks unneeded expenditures to buy the disposed of items again.

On-order excess inventory: Results across DLA's aviation, land, and maritime organizations—referred to as supply chains—have varied, with increases for land and maritime in fiscal year 2013. Also, DLA has not established supply chain-specific goals and does not regularly collect data or review on-order excess inventory performance for its supply chains, as it does with numerous other metrics, such as backorders. Although DLA has shown progress toward meeting DOD's goal for reducing on-order excess inventory, without establishing supply-chain goals and monitoring performance it may be challenged to meet its goal of reducing on-order excess to 4 percent by the end of fiscal year 2016.

DLA has implemented several improvement efforts, such as new methods for setting inventory levels and reducing procurement time. However, DLA data shows that its collaborative forecasting effort, which uses customer input to produce forecasts, has not improved aggregate forecast accuracy. DLA measures forecast accuracy, but lacks metrics for key aspects of performance, such as cost and return on investment, as required by DOD guidance, or regular performance meetings to monitor results and guide continued improvement. Without improved management of collaborative forecasting, DLA may not be using its resources efficiently and effectively to improve forecasting accuracy.

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Abbreviations

DLA	Defense Logistics Agency
DOD	Department of Defense
DORRA	DLA Office of Operations Research and Resource Analysis

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June 19, 2014

The Honorable Robert 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,¹ with a reported value of approximately \$95 billion as of September 2012.² The Defense Logistics Agency (DLA) manages about one-fifth of DOD's inventory, specifically consumable parts³ and other supplies needed to keep military equipment ready and operating. As we have previously reported, the federal government is facing serious long-term fiscal challenges, and DOD likely will encounter considerable budget pressures over the next decade.⁴ To address these pressures, DOD issued strategic guidance in January 2012 emphasizing the need to reduce its cost of doing business, in particular finding efficiencies in overhead, business practices, and support activities.⁵ 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

¹DOD 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.

²End of fiscal year 2012 data were the most recent available at the time of this report since DOD had not released its *Supply System Inventory Report* for the end of fiscal year 2013. Unless otherwise stated, all dollar figures in this report are in nominal terms.

³Consumables are those items that are normally expended or intended to be used up beyond recovery.

⁴GAO, *The Federal Government's Long-Term Fiscal Outlook: Spring 2013 Update*, [GAO-13-481SP](#) (Washington, D.C.: April 2013).

⁵Department of Defense, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Jan. 5, 2012).

to continue efforts to reduce overhead and become more efficient. In light of these efforts, effective and efficient inventory management—a key support activity that affects the readiness of the force—is critical for DOD to avoid spending resources on unneeded inventory that could be better applied to other defense and national priorities.

Since 1990, we have identified DOD supply-chain management⁶ 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 challenges in achieving widespread implementation of key technologies aimed at improving asset visibility.⁷ These factors have contributed to the accumulation of billions of dollars in spare parts that are excess to current needs.⁸ We reported in 2012 and 2013 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 2010.⁹ DOD established overarching goals in the plan to reduce the enterprise-wide percentages of on-order excess inventory—those items already purchased but that may be excess due to subsequent changes in requirements—and on-hand excess inventory¹⁰—those items categorized for potential reuse or disposal. Since DOD was exceeding its initial goals

⁶DOD'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.

⁷This high-risk area was originally identified in 1990 as DOD inventory management. In 2005, it was expanded to DOD's management of its entire supply chain, which includes three focus areas for improvement: requirements forecasting, asset visibility, and materiel distribution. For our most-recent update, see GAO, *High-Risk Series: An Update*, [GAO-13-283](#) (Washington, D.C.: February 2013).

⁸GAO, *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).

⁹GAO, *Defense Inventory: Actions Underway to Implement Improvement Plan, but Steps Needed to Enhance Efforts*, [GAO-12-493](#) (Washington, D.C.: May 2012); and [GAO-13-283](#).

¹⁰On-hand excess inventory is distinct from on-hand inventory. On-hand inventory is the amount of inventory in DLA's possession.

for reducing excess inventory, we recommended that DOD's efforts would benefit from establishing more-challenging, but achievable, goals for reducing excess inventory and that the department periodically reexamine and update its goals. In response, DOD 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 maintains that its current 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.

In response to your request that we evaluate DLA's inventory management, this report assesses the extent to which DLA has (1) developed and met goals to reduce on-hand inventory and on-order excess inventory while reducing backorders (i.e., parts shortages) and faced any implementation challenges, and (2) implemented initiatives using a comprehensive management approach to improve inventory management. We also examined the extent to which DLA's metrics balance the timely availability of spare parts with total supply-chain costs, and report on this issue in appendix II. This is the first in a series of our reviews examining DOD's inventory management. Three additional reviews on Army, Navy, and Air Force inventory management are underway, pursuant to a congressional request, and we plan to report the results in early 2015.

To assess the extent to which DLA developed and met goals to reduce on-hand inventory and on-order excess inventory while reducing shortages and faced any implementation challenges, we analyzed DLA's November 2009 through September 2013 inventory data, which stratify inventory into categories to assess the ability of the inventory to meet military services' requirements and ensure that surplus inventories are kept only if warranted.¹¹ To assess the reliability of the data, we reviewed

¹¹Per DOD guidance, DLA and the military services are required to stratify and report inventory data biannually as of March 31 and September 30 and use the stratification data to assess the ability of the inventory to meet the stated requirement and ensure that surplus inventories are kept only if warranted. 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). DLA made changes to the structure of its inventory data in October 2009, which meant the earliest data we could use to conduct our analysis were from November 2009.

DOD requirements for secondary spare parts inventory reporting, comparing the data we generated from DLA-provided electronic files to its summary tables, searching for and reconciling inconsistent information, and discussing DLA's data and our findings with database managers. We determined the inventory data were sufficiently reliable for the purposes of this report in determining DLA's amount of inventory and reasons for holding that inventory. We focused our analysis on data from DLA's aviation, land, and maritime supply chains since they constituted \$9.8 billion of DLA's \$13.1 billion in nonenergy inventory¹² at the end of fiscal year 2012. With respect to on-order excess inventory, we analyzed DLA's inventory data to determine the amount of on-order excess inventory and reviewed DLA's processes for managing and overseeing on-order excess inventory and compared these processes against leading practices for results-oriented management.¹³ With respect to backorders for spare parts, we reviewed DLA-generated reports to assess the status and extent of its efforts to reduce the number of backorders, and reviewed DLA's aviation, land, and maritime goals for reducing backorders and evaluated DLA's progress in meeting those goals. We also examined DLA performance-management briefings; documentation related to DLA's effort to reduce its on-hand inventory, on-order excess inventory, and backorders; DOD and DLA inventory-management policies and procedures; and other reports and analyses related to the potential for buying inventory again after it is disposed of.¹⁴ We interviewed DLA headquarters and aviation, land, and maritime supply-chain officials to discuss DLA's efforts to reduce on-hand inventory, on-order excess inventory, and backorders. Additionally, we met with Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration officials to discuss DLA's efforts.

¹²We did not include energy in our analysis because DOD's *Comprehensive Inventory Management Improvement Plan* does not focus on energy inventory.

¹³GAO, *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); *Managing For Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005); and *Agency Performance Plans: Examples of Practices That Can Improve Usefulness to Decisionmakers*, [GAO/GGD/AIMD-99-69](#) (Washington, D.C.: Feb. 26, 1999).

¹⁴DOD Manual 4140.01, Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition* (Feb. 10, 2014).

To assess the extent to which DLA has implemented initiatives using a comprehensive management approach to improve inventory management, we interviewed officials with DLA headquarters and the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration to identify improvement initiatives. We focused on four key efforts DLA officials identified as significant to reducing excess inventory: collaborative forecasting, inventory level-setting for items with low or highly variable demand, improving acquisition lead-time accuracy and reducing acquisition lead times, and improving efficiency of DLA's supply, storage, and distribution processes. We analyzed DLA's collaborative forecasting, which is a process that allows DLA and the military services to work together to tailor forecast plans for items rather than DLA establishing a forecast based solely on historical demand patterns, by reviewing DLA's metrics to evaluate the extent its metrics addressed performance and costs, as required by DOD guidance.¹⁵ Additionally, we reviewed and analyzed DLA's management approach for the program to determine whether it followed leading practices for results-oriented management, such as holding regular performance-management meetings to guide continued improvement.¹⁶ We discussed the metrics and the assessment methodology DLA uses for tracking and evaluating collaborative forecasting performance with DLA headquarters and aviation, land, and maritime supply-chain officials. We also discussed the challenges and weaknesses of the metrics for assessing collaborative forecasting with various DLA officials. To examine the extent to which DLA has implemented metrics that balance the timely availability of spare parts to customers with total supply-chain costs, we analyzed DLA's use of metrics to manage its inventory and reviewed documentation from a number of different metrics meetings held at DLA headquarters and supply chains. Appendix III provides further information on our scope and methodology.

We conducted this performance audit from June 2013 to June 2014 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

¹⁵DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting*, and Volume 2, *DOD Supply Chain Materiel Management Procedures: Demand and Supply Planning* (Feb. 10, 2014).

¹⁶[GAO-13-228](#) and [GAO-05-927](#).

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.

Background

The DOD supply chain is a global network that provides materiel, services, and equipment to the joint force. DOD's supply-chain responsiveness and reliability affects the readiness and capabilities of military forces and is critical to the overall success of joint operations. According to DOD joint doctrine, logisticians must manage DOD's equipment and inventory, manage global distribution and supplier networks, and integrate all aspects of the supply chain. Inventory management is the process of determining requirements, and procuring, managing, cataloging, distributing, overhauling, and disposing of materiel.¹⁷ Managing inventory throughout the supply chain requires collaboration with supply and maintenance activities and distribution providers to enable the greatest effect at best value. Managing global distribution and supplier networks is integral to supply-chain operations to ensure delivery of the right items to the right place at the right time.¹⁸ Logisticians manage supplies and equipment by providing visibility over assets, which should result in a seamless integration of supply operations from acquisition to delivery.¹⁹

The military services, U.S. Transportation Command, and DLA are key supply-chain organizations that constitute DOD's supply-chain network. The military services are responsible for supplying, organizing, training, and equipping the force. To carry out this responsibility, the military services procure and manage inventory to support the maintenance of their equipment and to equip the force. U.S. Transportation Command, in addition to its responsibilities for transporting supplies and equipment in support of military operations, has been designated as DOD's Distribution Process Owner with responsibility for overseeing the overall

¹⁷See [GAO-12-493](#) for our most-recent work on DOD's inventory management.

¹⁸See GAO, *Defense Logistics: DOD Has Taken Actions to Improve Some Segments of the Materiel Distribution System*, [GAO-12-883R](#) (Washington, D.C.: Aug. 3, 2012) for our most-recent work on DOD's materiel distribution system.

¹⁹See GAO, *Defense Logistics: A Completed Comprehensive Strategy is Needed to Guide DOD's In-Transit Visibility Efforts*, [GAO-13-201](#) (Washington, D.C.: Feb. 28, 2013) for our most-recent work on DOD's asset visibility.

effectiveness, efficiency, and alignment of DOD-wide distribution activities.²⁰ DLA manages, integrates, and synchronizes suppliers and supply chains to provide materiel to the military services, allies, and multinational partners. DLA provides support across nine diverse supply chains: aviation, clothing and textile, construction and equipment, energy, land, maritime, medical, industrial hardware, and subsistence. To carry out its responsibilities, DLA manages a global network of distribution depots that receive, store, and issue a wide range of commodities owned by the military services, General Services Administration, and DLA.

Management and oversight of DLA inventory is a responsibility shared between the Under Secretary of Defense for Acquisition, Technology and Logistics and the DLA Director. The Under Secretary of Defense for Acquisition, Technology and Logistics is responsible for developing materiel-management policies and ensuring their implementation in a uniform manner throughout the department, while the DLA Director is responsible for implementing DOD policies and procedures for materiel management.

DLA Currently Manages about One-Fifth of DOD's \$95 Billion of Inventory

DOD reported that the total value of its inventory was about \$95 billion as of September 30, 2012. The value of DLA's inventory (including energy) at the end of fiscal year 2012 was \$20.8 billion, which is approximately one-fifth of the value of DOD's inventory (see table 1).²¹

²⁰According to DOD Instruction 5158.06, *Distribution Process Owner (DPO)* (Sept. 11, 2007), the process owner "has the responsibility for coordinating, sustaining, and improving processes; coordinating the creation of new processes, where appropriate; and being accountable for their outcomes. Process owners advocate improvements for and across all DOD components for effectiveness, efficiency, and alignment relevant to a particular process." See also DOD Directive 5158.04, *United States Transportation Command (USTRANSCOM)* (Sept. 11, 2007).

²¹DLA is the DOD executive agent for bulk petroleum and is responsible for all bulk petroleum supply management from source of supply to the point of customer acceptance, with emphasis on improving efficiency.

Table 1: Value of the Department of Defense’s (DOD) and the Defense Logistics Agency’s (DLA) Inventory, Fiscal Years 2009-2012

Billions of nominal dollars

Fiscal year	Value of DOD inventory ^a	Value of DOD inventory owned by DLA (including energy)	Percentage of DOD inventory owned by DLA (including energy)
2009	\$89.9	\$16.9	18.8%
2010	95.6	19.0	19.9
2011	98.9	21.3	21.5
2012	95.0	20.8	21.9

Source: GAO analysis of DOD data.

Notes: DOD values inventory at latest acquisition cost, with reductions for reparable inventory in need of repair and salvage prices for potential reutilization/disposal stock (or on-hand excess). These values are reported in DOD’s annual *Supply System Inventory Report*. Fiscal Year 2013 department-wide inventory values were not available at the time of the issuance of this report.

^aTotal values of DOD inventory includes inventory held by the military services.

In fiscal year 2012, the value of DLA’s aviation, land, and maritime supply chains comprised approximately 75 percent of the value of DLA’s non-energy inventory, or approximately \$9.8 billion of DLA’s \$13.1 billion non-energy inventory (see table 2).

Table 2: Value of Aviation, Land, and Maritime Supply Chains’ Inventory, Fiscal Years 2009-2012

Billions of nominal dollars

Fiscal year	Value of DLA inventory (including energy)	Value of DLA inventory (excluding energy)	Value of DLA aviation, land, and maritime supply chains	Percentage of DLA inventory (excluding energy) held by aviation, land, and maritime supply chains
2009	\$16.9	\$12.4	\$9.8	79.0%
2010	19.0	13.7	11.0	80.3
2011	21.3	13.7	11.1	81.0
2012	20.8	13.1	9.8	74.8

Source: GAO analysis of DOD data.

Notes: DOD values inventory at latest acquisition cost, with reductions for reparable inventory in need of repair and salvage prices for potential reutilization/disposal stock (or on-hand excess). These values are reported in DOD’s annual *Supply System Inventory Report*. Fiscal Year 2013 department-wide inventory values were not available at the time of the issuance of this report.

DLA's Process for Categorizing Inventory for Reporting Requirements

DOD guidance requires DLA to assess the ability of the inventory to meet the military services' requirements and ensure that surplus inventories are kept only if warranted.²² To accomplish this directive, the guidance requires the services and DLA to group their item inventories into several specific categories, according to the purpose for which they are held.²³ 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 categories include inventory needed to support the approved acquisition objective²⁴ and three inventory categories that exceed the approved acquisition objective (see fig. 1).²⁵ As reported by DLA, the approved acquisition objective includes materiel needed to meet the requirements objective, 2 years of estimated future demand, war-reserve materiel held for the services,²⁶ and materiel held because it comes from a diminishing manufacturing source.²⁷ The three categories that exceed the approved acquisition objective are economic

²²DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting*.

²³DOD Manual 4140.01, Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition*.

²⁴DOD guidance defines the approved acquisition objective as the quantity of an item authorized for peacetime and wartime requirements to equip and sustain U.S. and allied forces.

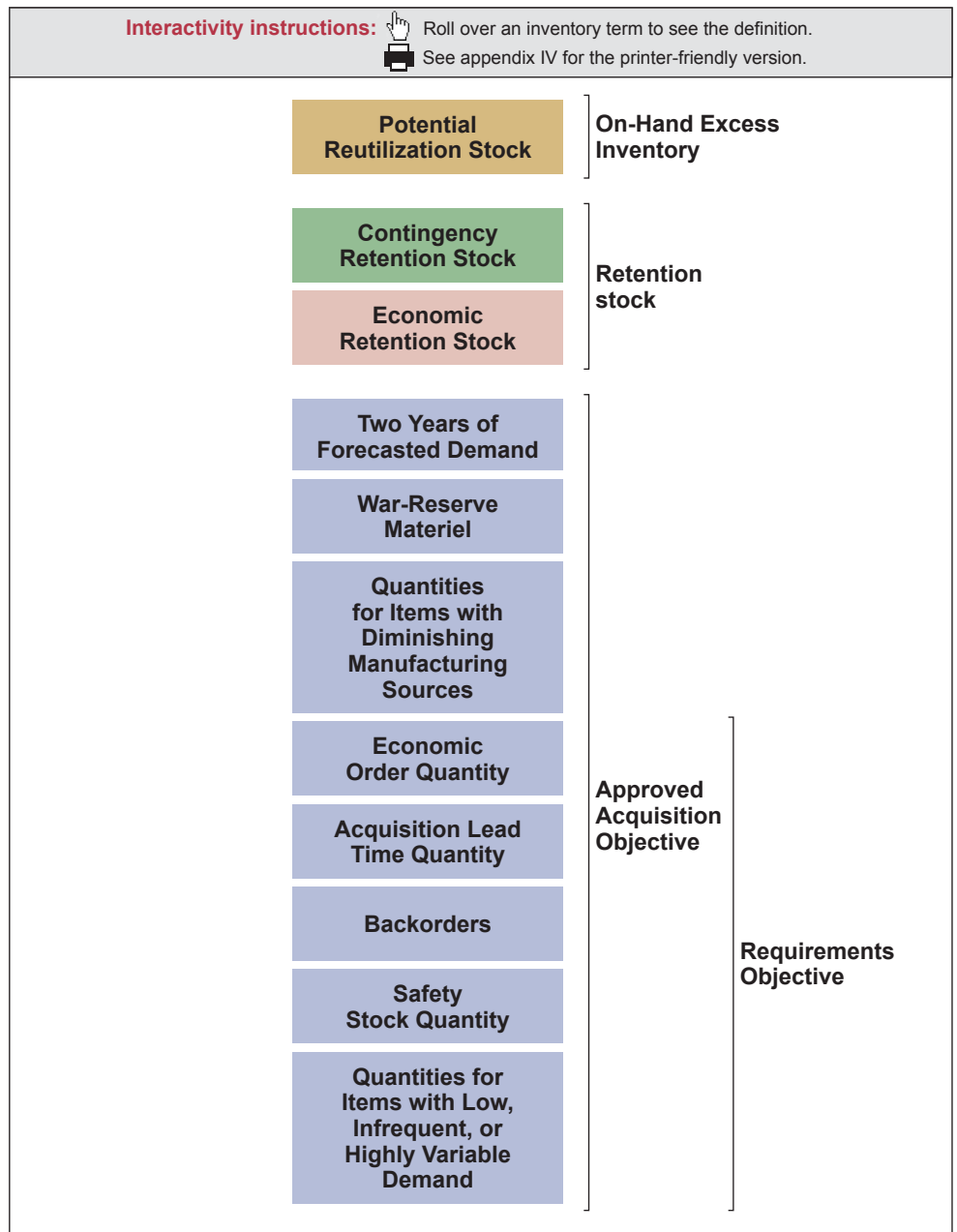
²⁵The amount of inventory in each category is based on a snapshot at a particular point in time and fluctuates due to changes in demand rates for individual items. The changes in demand affect the size of each category, thereby affecting the distribution of inventory across the categories on an item 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 that item may not have any stock categorized as economic retention stock due to an increase in demand for the particular item. 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 be comprised of the same items at the same quantities as \$1 billion in economic retention stock at a later point in time.

²⁶DLA holds materiel in this category for the military services when the services have unfunded war-reserve requirements.

²⁷DLA holds materiel with a diminishing manufacturing source in this category. DLA plans to hold on-hand materiel that is above the approved acquisition objective with a diminishing manufacturing source as contingency retention stock by the end of fiscal year 2014.

retention stock, contingency retention stock, and potential reutilization stock (i.e., on-hand excess inventory). Figure 1 summarizes how DLA inventory categories are aggregated for reporting. Appendix IV provides a printer-friendly version of figure 1.

Figure 1: Selected Categories of the Defense Logistics Agency's (DLA) Inventory



Source: GAO analysis of Department of Defense (DOD) guidance and DLA inventory practices. | GAO-14-495

As reported by DLA, the requirements objective is the sum of stock represented by

- safety levels—amount of stock that is to be kept on hand in case of minor interruptions in the resupply process or fluctuations in demand;
- backorders—customer-requisitioned materiel that is not immediately available to issue, but is recorded as a commitment for future issue;
- stock needed to cover acquisition lead times;²⁸
- the economic order quantity—quantity derived from a mathematical technique used to determine the lowest total variable costs to order and hold inventory; and
- items with low, infrequent, or highly variable demand.²⁹

Inventory that exceeds the approved acquisition objective is categorized as retention stock or potential reutilization stock. Retention stock includes economic retention stock, which is materiel that has been calculated to be more economical to keep than to dispose of because it is likely to be needed in the future, and contingency retention stock, which is materiel retained to support specific contingencies.³⁰ Potential reutilization stock has been identified for possible disposal but has potential for reuse and is under review for transfer to DLA Disposition Services.³¹ Potential reutilization stock is also referred to as on-hand excess inventory. Additionally, DLA tracks 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

²⁸Acquisition lead time includes both administrative and production lead time. Administrative lead time is the interval between identifying a need to purchase an item and the award of a contract. Production lead time is the interval between the award of a contract and receiving the purchased materiel into the supply system.

²⁹Low, infrequent, or highly variable demand items are those items that need to be stocked where the requirement for parts cannot be forecast.

³⁰The contingencies include, but are not limited to, supporting foreign military sales, future military operations, disaster relief or civil emergencies, or mitigating risk associated with diminished manufacturing sources or nonprocurable stock.

³¹DLA 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 on a competitive basis or disposed of in an environmentally safe manner.

arrival as economic retention stock, contingency retention stock, or potential reutilization stock. (See app. V for an overview of the typical causes of on-hand excess inventory.)

DLA Has Reduced Its On-Hand Inventory and Met Reduction Goals, but Disposed of Items That May Have to Be Bought Again and Lacks Oversight of Its On-Order Excess Inventory

DLA has significantly reduced its amount of on-hand inventory by setting internal goals for inventory reduction and disposing of nearly \$4 billion of on-hand inventory; however, DLA disposed of about \$855 million in items that DLA's analyses show were more economical to keep due to the likelihood of the items needing to be bought again. DLA has also made progress in reducing its on-order excess inventory since 2011, but results across DLA's aviation, land, and maritime supply chains have varied, including increases in on-order excess inventory in fiscal year 2013 for the land and maritime supply chains. In addition, DLA does not routinely monitor on-order excess levels and lacks supply chain-specific goals to focus the supply chains' efforts. Finally, DLA has reduced backorders—part shortages that can affect the readiness of operational units as well as delay work at maintenance depots—by nearly 30 percent through intensive management practices, such as monthly reviews.

DLA Has Disposed of Significant Amounts of Excess Inventory to Meet Its Inventory-Reduction Goals, but Analyses Show That Some Stock May Have to Be Bought Again in the Near Future

DLA established goals for reducing the amount of its on-hand inventory in February 2012 and met its fiscal year 2013 goal in part by disposing of more than \$4 billion of on-hand inventory; however, DLA disposed of about \$855 million in items that DLA's analyses show were more economical to keep due to the likelihood of the items needing to be bought again. DLA used a risk-based approach to identify inventory to be disposed of, resulting, for example, in a reduction of about \$660 million of inventory for which there had been no demand in over 5 years. Furthermore, to meet its end of fiscal year 2014 goal, DLA's analysis shows that it will likely need to reduce, largely through disposals, approximately \$1.9 billion more in inventory that DLA analyses have determined are more economical to keep.

DLA Goals and Timelines
for Reducing Its On-Hand
Inventory by \$6 Billion Have
Evolved over Time

In February 2012, DLA established a goal of achieving a \$6 billion on-hand inventory reduction by the end of fiscal year 2017, which meant reducing on-hand inventory from \$14.2 billion to approximately \$8.2 billion.³² According to DLA headquarters officials, the goal was established to reduce warehouse costs for storing inventory and to right-size DLA's inventory to prevent cuts to DLA's working capital fund obligation authority.³³ In December 2012, DLA accelerated its target date for reaching \$8.2 billion in on-hand inventory to the end of fiscal year 2015. In addition, DLA established end of the fiscal year interim goals of \$11.7 billion and \$10.1 billion for 2013 and 2014, respectively. In May 2013, DLA again accelerated its schedule for reducing on-hand inventory to \$8.2 billion and achieving a \$6 billion reduction in on-hand inventory by the end of fiscal year 2014. See table 3 for a timeline of changes to DLA's on-hand inventory goals and schedule.

³²One of the goals of the *Comprehensive Inventory Management Improvement Plan* is to reduce on-hand excess inventory (also referred to as potential reutilization stock) to 8 percent of the total value of on-hand inventory by fiscal year 2016. However, DLA's inventory-reduction goals are much broader than reducing on-hand excess inventory. DLA is focused on reducing on-hand inventory levels 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. See app. I for a brief overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

³³A 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 obligational authority to procure additional spare parts in advance of a customer placing an order. A reduction to obligational authority means that the working capital fund has reduced purchase authority resulting in a lower inventory-replenishment rate.

Table 3: Timeline of Changes to Defense Logistics Agency's (DLA) On-Hand Inventory Goals and Schedule

Date	DLA's on-hand inventory goal	Action taken
February 2012	\$8.2 billion by end of fiscal year 2017	DLA establishes goal of a net \$6 billion reduction to on-hand inventory (from \$14.2 billion to \$8.2 billion)
December 2012	\$11.7 billion by end of fiscal year 2013 \$10.1 billion by end of fiscal year 2014 \$8.2 billion by end of fiscal year 2015	DLA accelerates the schedule for achieving the net \$6 billion reduction to fiscal year 2015 and identifies annual goals for fiscal years 2013 and 2014
May 2013	\$11.7 billion by end of fiscal year 2013 \$8.2 billion by end of fiscal year 2014	DLA accelerates the schedule for achieving the net \$6 billion reduction to fiscal year 2014
November 2013	\$10 billion by end of fiscal year 2014	DLA changes the fiscal year 2014 goal to \$10 billion after aviation, land, and maritime supply-chain officials demonstrate potential negative effects of reducing on-hand inventory to \$8.2 billion

Source: GAO analysis of DLA information.

From June through September 2013, aviation, land, and maritime supply-chain officials presented analyses to the DLA Director demonstrating the potential negative effect—the need to buy inventory again after disposal and the decrease in the availability of spare parts to customers—of reducing on-hand inventory to \$8.2 billion by the end of fiscal year 2014. As a result, in October 2013 the DLA Director revised the goal for the end of fiscal year 2014 to approximately \$10 billion in on-hand inventory, thereby slowing the reduction of DLA's on-hand inventory. According to DLA officials, the fiscal year 2014 goal of \$10 billion may be changed later in fiscal year 2014 if it appears unobtainable without significant rebuy risk. Also, future inventory reductions beyond the fiscal year 2014 goal will be discussed and analyzed in late fiscal year 2014, according to DLA officials.

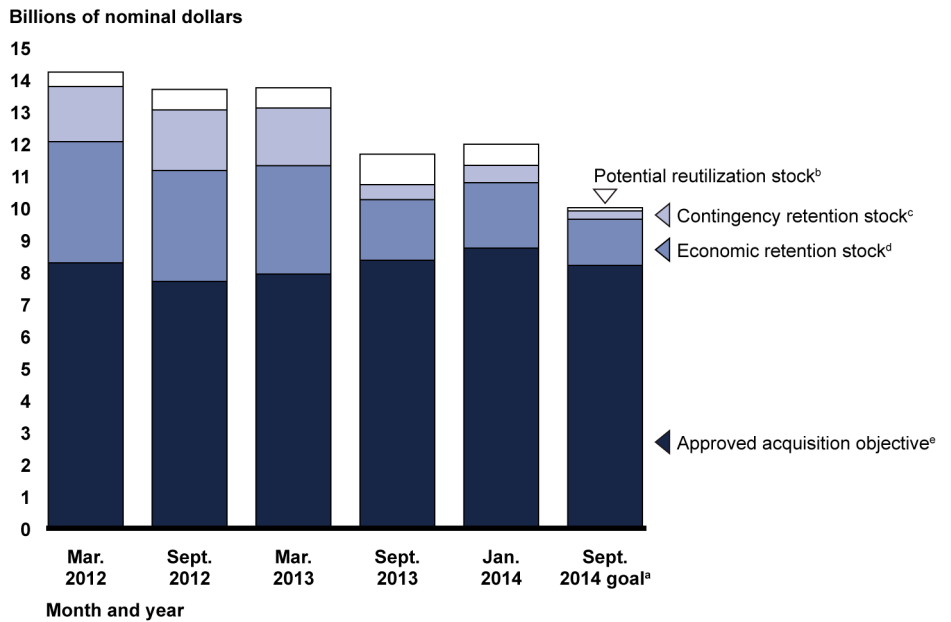
DLA Has Disposed of \$4 Billion in On-Hand Inventory to Reach Its Fiscal Year 2013 Goal

To meet its fiscal year 2013 goal of \$11.7 billion on-hand inventory, DLA disposed of \$4 billion in inventory over fiscal years 2012 and 2013, which contributed to a net inventory reduction of more than \$2.5 billion.³⁴ Disposing of inventory is the process of reutilizing, transferring, selling, or destroying items.³⁵ See figure 2 below for DLA's on-hand inventory levels from March 2012 until the end of fiscal year 2013. In addition, see appendix VI for the on-hand inventory levels at the aviation, land, and maritime supply chains.

³⁴The disposal of \$4 billion in on-hand inventory does not translate into a \$4 billion reduction in total on-hand inventory due to inventory being procured and received to meet demands of customers. In other words, DLA's inventory is not static; the levels of inventory for individual items and in aggregate change constantly. For example, DLA is simultaneously providing inventory to its military customers, ordering more stock to satisfy future requirements, and disposing of inventory no longer needed.

³⁵DLA 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 on a competitive basis or disposed of in an environmentally safe manner. In this review, we did not examine the disposal processes and the amount of disposed inventory that falls into each category. We have initiated work looking at DOD's process for disposing of excess personal property, including challenges DOD faces in this area and DOD's capacity to manage increases in the amount of excess personal property to be processed. We expect to report on this in 2015.

Figure 2: Defense Logistics Agency (DLA) Inventory Levels from End of March 2012 to End of September 2013



Source: GAO analysis of DLA data. | GAO-14-495

^aThe breakout of the categories for the September 2014 goal is notional.

^bPotential reutilization stock is materiel exceeding the approved acquisition objective and not being retained as economic or contingency retention stock, and has been identified as excess materiel for possible disposal but has potential for reutilization. Potential reutilization stock is also referred to as on-hand excess inventory.

^cContingency retention stock is materiel that is retained to support specific contingencies, such as to support foreign military sales, future military operations, and disaster relief or civil emergencies, or to mitigate risk associated with diminishing manufacturing sources or nonprocureable stock.

^dEconomic retention stock is materiel that has been deemed more economical to keep than to discard because it is likely to be needed in the future.

^eApproved acquisition objective includes materiel needed to meet the requirements objective, 2 years of estimated future demand, war-reserve materiel held for the services, and materiel held because it comes from a diminishing manufacturing source.

According to DLA headquarters officials, the benefits of reducing on-hand inventory are (1) achieving cost-savings by reducing the warehouse infrastructure needed to store on-hand inventory and (2) preventing reductions to DLA’s working capital fund obligational authority, which might reduce supply availability for the military customers. First, according to DLA headquarters officials, the inventory reductions have helped DLA

to reduce its warehouse infrastructure and return 6.7 million gross square feet of warehouse space to its owner, typically a military service, since June 2011.³⁶ However, DLA's inventory-reduction effort has not focused on maximizing warehouse reductions and there is not a direct or consistent correlation between the dollar value of inventory and the amount of space required to store the inventory. Second, according to DLA headquarters officials, the inventory-reduction effort also has demonstrated DLA's commitment to right-sizing its on-hand inventory against current operational requirements, which officials believe will minimize the likelihood of reductions to DLA's working capital fund's obligation authority.³⁷ A reduction to DLA's working capital fund obligation authority could prevent DLA from procuring parts needed by its customers.

Of the \$4 billion in inventory disposed of over fiscal years 2012 and 2013, the aviation, land, and maritime supply chains collectively disposed of \$3.6 billion in inventory. DLA headquarters and aviation, land, and maritime supply-chain officials told us they used risk assessments to identify inventory for disposal. Generally, DLA headquarters and these supply chains prioritized inventory for disposal based on numerous

³⁶According to DLA headquarters officials, approximately 4 million gross square feet of this reduction is closely associated with on-hand inventory reduction at two DLA distribution centers—San Joaquin, California, and Susquehanna, Pennsylvania, where about 66 percent of DLA's on-hand inventory reduction occurred from June 2012 through September 2013. DLA operates 25 distribution centers around the world. Seventeen of the centers are in the continental United States while eight of the centers are outside of the continental United States. These centers are responsible for the receipt, storage, issue, packing, preservation, and transportation of DLA-managed items.

³⁷According to DLA headquarters officials, they are attempting to avoid the readiness effects that occurred as a result of the budget reductions during the 1990s. Specifically, DLA headquarters officials believe that high on-hand inventory levels were used as justification for substantially reducing the materiel replenishment rate of defense working capital funds for spare parts during the 1990s. A materiel replenishment rate is the ratio at which a working capital fund can replace sold inventory. For example, a ratio of 1.0 would allow a working capital fund to replace inventory sold dollar for dollar, whereas a ratio of less than 1.0 means for every dollar of inventory sold the working capital fund is replenished at a lower rate. According to DLA headquarters officials, during the 1990s its authorized replenishment rate allowed DLA to replenish only 50 to 60 percent of its inventory sales. This low level of replenishment reduced its ability to purchase inventory needed by its customers (i.e., the military services) and created materiel availability and readiness issues, according to DLA officials. According to DLA headquarters officials, right-sizing on-hand inventory levels achieves the same result—reduction of on-hand inventory—by the targeting of unneeded inventory for disposal without the negative effect on materiel availability associated with reducing materiel replenishment rates.

variables, such as potential effects on customer service and responsiveness, risk of needing to buy the inventory again, and years with no demand. For example, the aviation supply chain, in collaboration with a private contractor, developed a tool that assesses individual items based on a number of factors, such as demand frequency, the criticality to particular weapon systems, and procurement characteristics, such as long production lead times. The tool prioritizes amounts of inventory for each item into categories that allow the aviation supply chain to identify the risk level associated with disposal.

DLA headquarters officials and aviation, land, and maritime supply-chain officials generally prioritized inventory for disposal in the following manner:

- **Identified potential reutilization stock and changed potential reutilization stock policies:** Per DLA's monthly inventory-stratification process, DLA identified inventory categorized as potential reutilization stock, which is stock that is no longer needed and has been identified for disposal, but has potential for reuse. Additionally, DLA changed its policy to decrease the amount of time between when an item is procured and is eligible to be categorized as potential reutilization stock from 2 years to 1 year in an effort to increase the amount of inventory eligible for disposal. Using the standard process for identifying potential reutilization stock and the change in policy, the aviation, land, and maritime supply chains disposed of \$1.4 billion of potential reutilization stock in fiscal years 2012 and 2013.
- **Changed contingency retention stock policies for weapon systems:** Prior to the inventory-reduction effort at DLA, the military services were allowed to exclude from disposal all inventory associated with a particular weapon system that was not needed to meet the approved acquisition objective or would not be retained for economic reasons.³⁸ The inventory that was excluded from disposal was retained as contingency retention stock. Based on our previous

³⁸The approved acquisition objective is the materiel needed to meet the requirements objective and 2 years of estimated future demand. The requirements objective is the maximum authorized quantity of stock for an item (for wholesale inventory replenishment), which consists of the sum of stock represented by the economic order quantity, the safety level, the quantity to cover acquisition lead times, quantities for items with low, infrequent, or highly variable demand, and backorders. Materiel retained based on economic reasons is referred to as economic retention stock, which is materiel that has been deemed more economical to keep than to dispose of because it is likely to be needed in the future.

work³⁹ and actions associated with the implementation of the *Comprehensive Inventory Management Improvement Plan*,⁴⁰ DLA, in collaboration with the military services, reduced the number of excluded weapon systems from 96 in fiscal year 2010 to 17 in fiscal year 2013. In addition, DLA imposed constraints on the amount of inventory that could be retained as contingency retention stock for the excluded weapon systems. As a result, the aviation, land, and maritime supply chains were able to dispose of approximately \$1.1 billion in inventory DLA deemed it no longer needed.

- **Changed categorization of inventory items associated with the Mine-Resistant Ambush Protected (MRAP) vehicle:** Prior to the inventory reduction, all items supporting the MRAP were categorized as part of the approved acquisition objective. During the inventory reduction effort, DLA worked closely with the MRAP program and determined that DLA could reduce the amount of inventory supporting the program. As a result, the aviation, land, and maritime supply chains disposed of approximately \$211 million in MRAP-related inventory.
- **Approved disposal of economic retention stock:** As a result of the risk assessments conducted, the aviation, land, and maritime supply chains disposed of about \$855 million inventory categorized as economic retention stock—inventory that DLA, through its economic analyses, had deemed more economic to keep than to dispose—in order to meet the end of the fiscal year 2013 on-hand inventory goal.

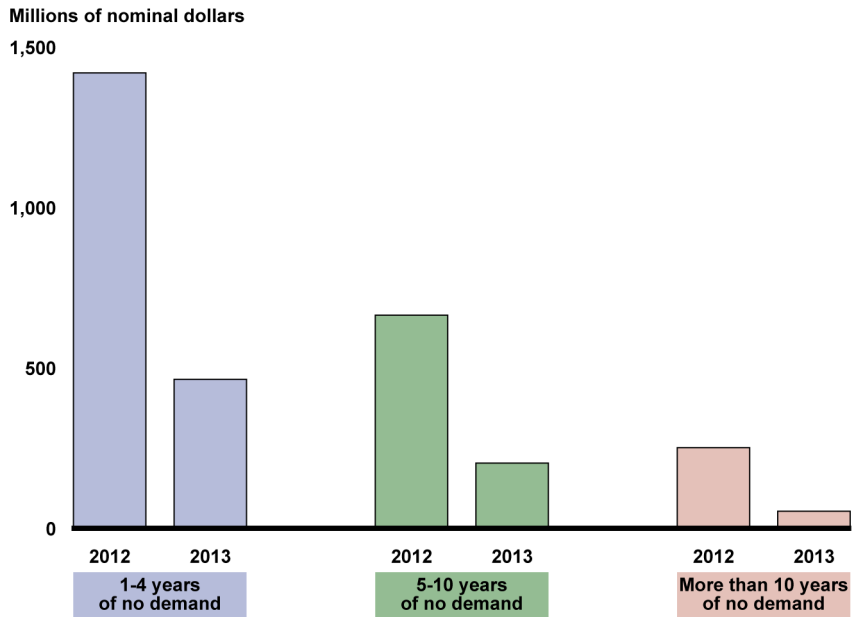
³⁹See [GAO-10-469](#). We found that contingency retention reviews should focus on verifying that the reason for contingency retention still exists and the reason is properly recorded. However, since DLA holds contingency retention stock for the military services, DLA depends on the services to provide input on which contingency inventory items are no longer needed and should be considered for disposal or reutilization. As a result, we recommended the Secretary of Defense direct the Secretaries of the Army, the Navy, and the Air Force to certify to DLA which items and what quantities of the contingency retention stock should be retained, in response to DLA's requests that they do so, and direct the Under Secretary of Defense for Acquisition, Logistics and Technology to provide guidance and oversight of this certification process. DOD concurred with the recommendation and, at the time of this report, was in the process of taking action to implement it.

⁴⁰DOD's *Comprehensive Inventory Management Improvement Plan* includes a subplan focused on improving the management of contingency retention stock. See app. I for a brief overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

Our analysis of inventory data shows that the disposal of inventory at the aviation, land, and maritime supply chains considerably reduced (1) the value of inventory held above the approved acquisition objective that did not have demands in over a year (see fig. 3) and (2) the value of inventory held beyond the approved acquisition objective by years of supply (see fig. 4). As shown in figure 3, the aviation, land, and maritime supply chains collectively reduced from fiscal years 2012 to 2013 the value of on-hand inventory above the approved acquisition objective by about \$950 million for items with 1 to 4 years of no demand, by about \$460 million for items with 5 to 10 years of no demand, and by about \$200 million for items with 10 years or more of no demand.⁴¹

⁴¹Items with no recurring demand are items that have not been needed by a customer over a specified period. In some cases, there may be justifiable reasons for retaining items that have not been needed in many years. For example, these items may be categorized and retained as part of the approved acquisition objective, economic retention stock, or contingency retention stock. The *Comprehensive Inventory Management Improvement Plan* has a subplan focused on reducing the amount of inventory that is being held with a history of no recurring demand across the department. The Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration tracks the inventory value by number of years of no demand, the value of inventory with 5 or more years of no demand by each category, and the value of no demand stock retained and disposed. See app. I for a brief overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan, including actions regarding items with no recurring demand.

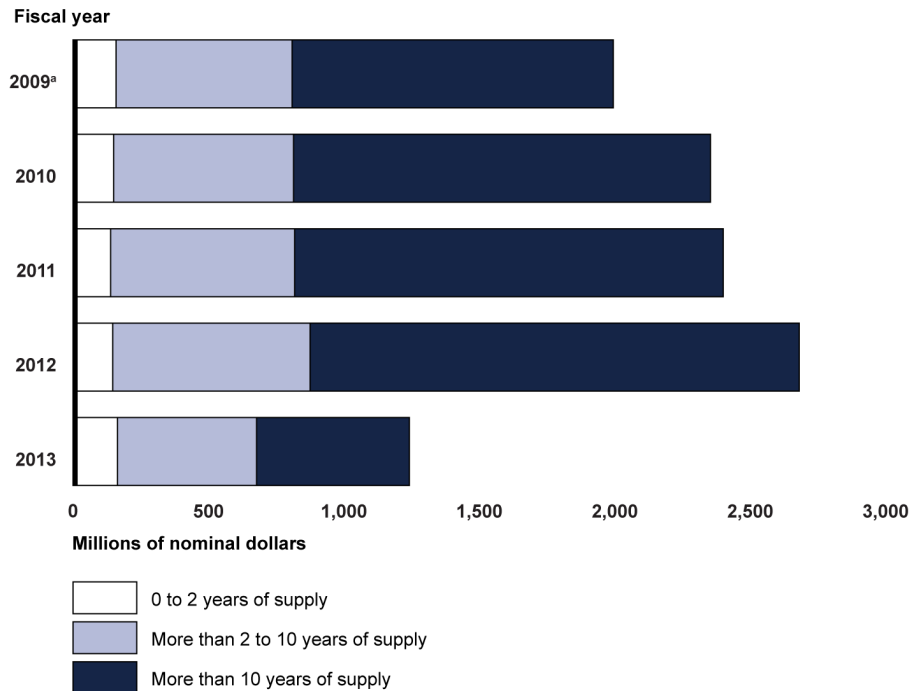
Figure 3: Value of Inventory Items with Years of No Demand Held by the Defense Logistics Agency's (DLA) Aviation, Land, and Maritime Supply Chains at the End of Fiscal Years 2012 and 2013



Source: GAO analysis of DLA data. | GAO-14-495

In addition, DLA has reduced inventory with over 2 years of projected supply and substantially reduced inventory with over 10 years of projected supply. A comparison of the supply data for fiscal year 2013 against fiscal year 2012 shows considerable progress in the reduction of on-hand inventory by years of supply. As shown in figure 4, about \$164 million of the inventory beyond the approved acquisition objective in fiscal year 2013 would supply up to 2 additional years of forecasted demand, about \$514 million of parts would meet more than 2 and up to 10 years of forecasted demand, and about \$564 million of parts would meet forecasted demand for over 10 years.

Figure 4: Value of the Defense Logistics Agency’s (DLA) Aviation, Land, and Maritime Supply Chain Inventory beyond the Approved Acquisition Objective by Projected Years of Supply, End of Fiscal Years 2009-2013



Source: GAO analysis of DLA data. | GAO-14-495

^aEnd of fiscal year 2009 inventory data were not available, so we used November 2009 data.

DLA Has Disposed of Inventory That May Have to Be Bought Again and Projects It Will Likely Dispose of Similar Stock to Meet Future Goals

To meet DLA’s goal of having \$11.7 billion in on-hand inventory at the end of fiscal year 2013, the aviation, land, and maritime supply chains disposed of \$855 million of inventory in fiscal year 2013 that was categorized as economic retention stock—items that were determined to be more economical to keep than to dispose of according to DLA’s economic analyses. Further, in order to meet its goal of \$10 billion in on-hand inventory by the end of fiscal year 2014, DLA’s analysis shows that it will likely have to reduce, largely through disposals, all its inventory categorized as retention stock, worth about \$3.3 billion, which will include all of its economic retention stock, contingency retention stock, and

potential reutilization stock.⁴² Of this \$3.3 billion in inventory, DLA projects, based on January 2014 inventory data, that it would need to reduce, largely through disposals, approximately \$1.9 billion in economic retention stock across all of its supply chains. Specifically, the aviation supply chain would need to reduce about \$757 million, the land supply chain about \$452 million, the maritime supply chain about \$186 million, and DLA's other supply chains about \$476 million.

DOD guidance states that inventory items for which there is no requirement should be disposed of unless economic or contingency reasons support their retention.⁴³ Furthermore, DOD guidance states that the decision to retain economic retention stock must be based on an economic analysis that balances the likelihood the item will need to be bought again with the cost of retention and disposal of the item.⁴⁴ Lastly, *Standards for Internal Control in the Federal Government*⁴⁵ and leading practices for results-oriented management emphasize the importance of reviewing and validating performance measures to ensure these measures remain appropriate.⁴⁶

⁴²As of January 2014, DLA held about \$12.0 billion of non-energy inventory and approximately \$3.3 billion of this inventory was being retained as retention stock—economic and contingency—or was categorized as potential reutilization stock. DLA also projects that it will receive about \$1.3 billion in new inventory over the remainder of fiscal year 2014. Thus, DLA will need to reduce, largely through disposal, all \$3.3 billion of retention stock to achieve its end of the fiscal year 2014 on-hand inventory goal of \$10.0 billion.

⁴³DOD Instruction 4140.01, *Supply Chain Materiel Management Policy* (December 2011). The contingencies include, but are not limited to, supporting foreign military sales, future military operations, disaster relief or civil emergencies, or mitigating risk associated with diminished manufacturing sources or nonprocureable stock.

⁴⁴DOD Manual 4140.01, Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition*.

⁴⁵GAO, *Auditing and Financial Management: Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (November 1999).

⁴⁶See GAO, *Results-Oriented Management: Strengthening Key Practices at FEMA and Interior Could Promote Greater Use of Performance Information*, [GAO-09-676](#) (Washington, D.C.: Aug. 17, 2009); *International Food Assistance: USAID Is Taking Actions to Improve Monitoring and Evaluation of Nonemergency Food Aid, but Weaknesses in Planning Could Impede Efforts*, [GAO-09-980](#) (Washington, D.C.: Sept. 28, 2009); and [GAO-05-927](#).

DLA's economic retention analyses have been extensively researched and recently updated. In 2008, DLA commissioned LMI⁴⁷ to develop a mathematical methodology to meet all of DOD's guidance for establishing economic retention limits, incorporate the best techniques from prior economic retention studies,⁴⁸ and be fully implemented within DLA's enterprise resource-planning system.⁴⁹ In 2009, DLA implemented LMI's methodology to determine its economic retention limits for items with a reasonably predictable demand rate.⁵⁰ Using this methodology, DLA determines the amount of economic retention stock that should be retained by establishing economic retention limits—the maximum amount of an item's inventory that can be retained according to an economic justification.⁵¹ The economic retention limits are developed through analyses that consider a number of variables, such as the cost of holding an item, the potential long-term demand for the items, potential rebuy costs, and items essential to the operation of a weapon system. In 2011, as part of the implementation of the *Comprehensive Inventory Management Improvement Plan*, DLA reevaluated its economic retention methodology in collaboration with the military services and the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration.⁵² In 2012 and 2013, DLA updated its methodology to account for changes in methods being used to manage its items as well as to update several

⁴⁷LMI is a private, not-for-profit corporation that provides management consulting, research, and analysis to governments and other nonprofit organizations across a range of public policy issues.

⁴⁸LMI, *Economic Retention in the Department of Defense: A Risk Perspective* (July 2007) and *Economic Retention within the Department of Defense* (December 2003).

⁴⁹An 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. DLA's enterprise resource-planning system is called the Enterprise Business System.

⁵⁰LMI, *Mathematical Methodology for Retention Levels at the Defense Logistics Agency* (April 2009).

⁵¹DLA's mathematical methodology computes economic retention by logical commodity groups while relying on characteristics of individual items. Consequently, items within the same group may have different quantities of economic retention, even though the same mathematical formula computes those quantities.

⁵²See app. I for a brief overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

cost factors, such as increasing the cost of storage, that are used in the analyses to determine the economic retention limits.

In 2012, DLA conducted a simulation that identified a large potential risk of needing to buy inventory again in the future due to disposing of all of its economic retention stock. The simulation showed that if DLA had disposed of its economic retention stock—worth about \$2 billion—in 2006, it would have bought 42 percent—or \$850 million—of the dollar value of the disposed items again over the next 5 years. According to a 2007 LMI study on economic retention of inventory within DOD, the risk of buying inventory again after disposal is high enough that buying inventory again should be viewed as a probability rather than a possibility, and the retain-or-dispose decision should be thought of in terms of planning for repurchasing. Furthermore, the study concluded that the savings from reduced inventory levels (i.e., holding less economic retention stock) do not offset the costs associated with having to buy inventory again. While the risk of buying inventory again varies among the components as well as among item groups across DLA and the military services, the study stated that economic retention limits, in general, should be set for at least 20 years of demand for most items.

Even though DLA's analyses have identified a significant rebuy risk from disposing of its economic retention stock, DLA disposed of \$855 million in economic retention stock in fiscal year 2013 in order to meet its inventory-reduction goals. According to DLA officials, the inventory reduction goals were meant originally to be "stretch" goals, but the accelerated schedule for achieving the goals resulted in the need to dispose of inventory rather than allowing it to be potentially consumed or become eligible for disposal when there was no longer an economic justification to retain the stock. DLA evaluated the option of disposing of \$855 million in economic retention stock, and the DLA Director stated that in order to reduce DLA's on-hand inventory he was willing to accept the risk of potentially having to buy previously disposed of inventory again. Furthermore, DLA's analysis shows that to meet the end of the 2014 fiscal year on-hand inventory goal of approximately \$10 billion, DLA will likely need to reduce, largely through disposal, most, if not all, of its economic retention stock—valued at approximately \$2 billion. We recognize that the DLA Director must balance the costs of holding and storing inventory that may not be needed in the short-term with the costs of potentially having to buy inventory again in the long term if it is disposed of. However, DLA's own analyses show that the savings from disposing of economic retention stock do not outweigh the likely rebuy costs over the long-term. Without reassessing its inventory-reduction goals and timelines in light of its own

analysis of economic retention stock, DLA risks having to buy hundreds of millions of dollars in inventory again, and incurring higher costs to do so, in order to meet customer demand and continue to support the readiness of the military services.

DLA Has Reduced On-Order Excess Inventory, but Supply-Chain Performance Varies and DLA Lacks Management Oversight of Its On-Order Excess Inventory Processes

Based on end of the 2011 through 2013 fiscal year data, DLA has reduced its organization-wide percentage of on-order excess inventory since 2011. However, performance in reducing on-order excess inventory varies across the aviation, land, and maritime supply chains. In addition, DLA does not routinely monitor on-order excess levels and lacks supply chain-specific goals to focus the supply chains' efforts and establish accountability for helping to achieve DLA's and DOD's overall goals for reducing on-order excess inventory.

DLA Has Reduced Its Aggregate On-Order Excess Inventory, but Supply-Chain Performance in Reducing On-Order Excess Inventory Has Varied

Since DOD began implementing the *Comprehensive Inventory Management Improvement Plan*, DLA has reduced its organization-wide amount of on-order excess inventory from 6.7 percent of the total value of on-order inventory in 2011 to 5.6 percent at the end of 2013.⁵³ These percentages are calculated based on end of the fiscal year inventory data. The Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration uses inventory data from September of each year to review DLA's and the services' on-order excess inventory performance against DOD's goal of having less than 6 percent on-order excess inventory at the end of fiscal year 2014 and less than 4 percent on-order excess inventory at the end of fiscal year 2016. The Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration reports the department-wide percentage of on-order excess inventory, as of the end of September each year, 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.⁵⁴ Additionally, the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration

⁵³See app. I for a brief overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

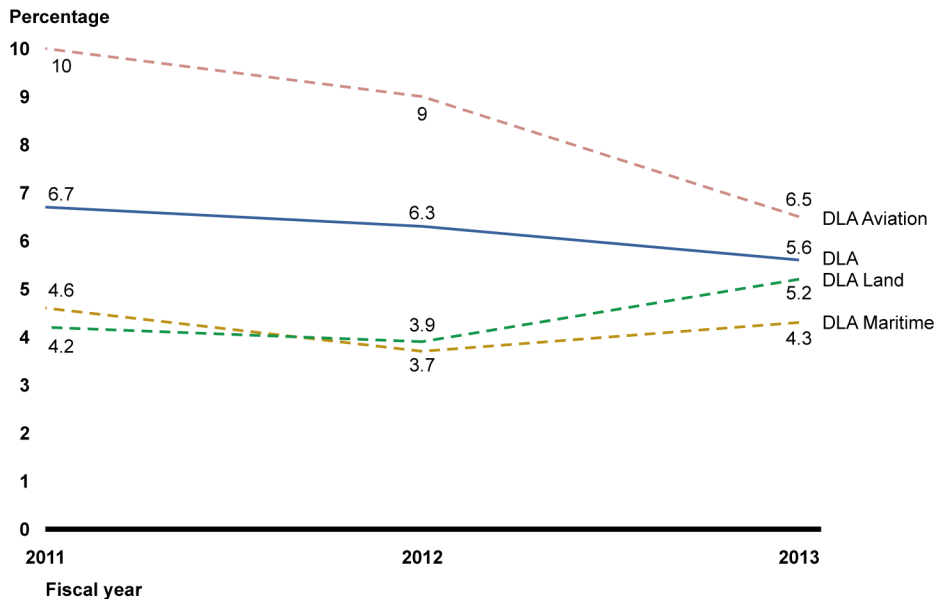
⁵⁴DOD also has included the department-wide percentage of on-order excess inventory as a key measure in the department's *Strategic Management Plan for Fiscal Years 2014-2015*.

reviews the percentage of on-order excess inventory as of the end of March each year as well.

At the end of fiscal year 2013, DLA's reported amount of on-order excess inventory was below DOD's interim goal of having 6 percent or less of on-order excess inventory at the end of fiscal year 2014.⁵⁵ However, the performance of the aviation, land, and maritime supply chains varies considerably. For example, the aviation supply chain reduced its level of on-order excess from 10 percent at the end of fiscal year 2011 to 6.5 percent at the end of fiscal year 2013. On the other hand, the land supply chain experienced an increase from 4.2 percent at the end of fiscal year 2011 to 5.2 percent at the end of fiscal year 2013. Furthermore, the maritime supply chain experienced an increase in the percentage of on-order excess inventory from 3.7 percent at the end of fiscal year 2012 to 4.3 percent at the end of fiscal year 2013. See figure 5 for DLA's on-order excess inventory percentages for the end of fiscal years 2011-2013. See appendix VII for the total value of on-order inventory and on-order excess inventory for fiscal years 2011 through 2013.

⁵⁵Although end of fiscal year 2013 data show that DLA is under the goal, inventory levels fluctuate and it will not be clear whether DLA actually achieves the goal until end of 2014 data are reported.

Figure 5: The Defense Logistics Agency’s (DLA) On-Order Excess Inventory Percentages, End of Fiscal Years 2011-2013



Source: GAO analysis of DLA data. | GAO-14-495

DLA Lacks Oversight of Its On-Order Excess Inventory Processes and Supply Chain-Specific Goals

While DLA’s organization-wide percentage of on-order excess inventory has decreased since fiscal year 2011, DLA senior management’s oversight of its on-order excess inventory can be strengthened. *Standards for Internal Control in the Federal Government*⁵⁶ and leading practices of federal agencies for results-oriented management⁵⁷ emphasize the importance of reviewing performance measures at the functional or activity level and linking the goals of component organizations to departmental strategic goals.

While the supply chains managed by DLA have processes established to monitor and reduce on-order excess inventory, senior managers at DLA headquarters do not regularly monitor performance of these processes. For example, DLA headquarters senior management also does not regularly review on-order excess inventory performance at DLA’s monthly performance management meetings as it does with numerous other

⁵⁶ [GAO/AIMD-00-21.3.1](#).

⁵⁷ See [GAO-13-228](#), [GAO-05-927](#), and [GAO/GGD/AIMD-99-69](#).

performance metrics, such as backorders and materiel availability, even though reducing on-order excess inventory is a key DOD goal to measure inventory-management improvement efforts.⁵⁸ DLA officials said that in establishing the key metrics for senior management review in late 2011 and early 2012, the DLA Director decided to focus on material availability, backorders, and the administrative workload associated with procuring inventory and that on-order excess inventory metrics was not included as a metric for regular review.

In addition, DLA has not consistently tracked and reported data to thoroughly measure its efforts to reduce on-order excess inventory. While it tracks the percentage of on-order excess inventory by each supply chain, DLA has not systemically and consistently tracked the amount of on-order excess inventory that is reviewed by supply planners for cancellation or modification, the amount that is cancelled or modified, and the reasons for not cancelling or modifying an on-order excess contract. Some of these data were manually collected in the past, but DLA officials told us that the effort to collect this type of data was halted after mid-2011 due to the need to refocus personnel on other inventory efforts. In late 2013, DLA began implementing a new automated report that will allow it to collect extensive data on its on-order excess inventory-management process, such as reasons for not modifying or canceling on-order excess inventory. However, DLA headquarters officials told us that management has not yet decided how it will use the information generated by the report to monitor performance and make necessary improvements to reduce on-order excess inventory.

Finally, DLA senior management has not established goals for each of its supply chains for reducing on-order excess inventory since late 2011, although DLA has established supply chain-specific goals for numerous other areas, such as backorders, materiel availability, and the percentage of items procured through long-term contracts. According to DLA headquarters and supply-chain officials, supply chain-specific goals in these other areas have helped to focus improvement efforts and improve performance. Specifically, DLA headquarters and supply-chain officials

⁵⁸DLA holds several performance-management meetings to review a suite of metrics that address a wide spectrum of DLA's operations and cover a number of metric areas, such as customer service, cost, and internal efficiency. However, DLA headquarters senior management does not regularly review metrics associated with on-order excess inventory. See app. II for an overview of DLA's performance metrics framework.

emphasized that supply chain–specific goals that are reviewed consistently by DLA senior management through regular performance briefings increase accountability throughout the chain of command. However, DLA management did not establish on-order excess inventory goals for each supply chain because this was not a management priority at the time, according to DLA officials. Additionally, supply chain–specific goals could take into account any expected variance in performance on reducing the percentage of on-order excess inventory, as do DLA’s already-established supply chain–specific goals.

Since DLA is not monitoring performance regularly, is not consistently tracking and reporting performance data, and has not established on-order excess inventory goals to guide improvement at the individual supply chains, DLA is not in the best position to maximize its reduction of on-order excess inventory. Focusing on preventing on-order excess inventory can assist in reducing on-hand excess inventory as well as prevent the increase in on-hand inventory levels, both of which are key goals at DLA. Strengthening its management of on-order excess inventory could better position DLA to invest only in inventory that meets the needs of the department at the time of its procurement.

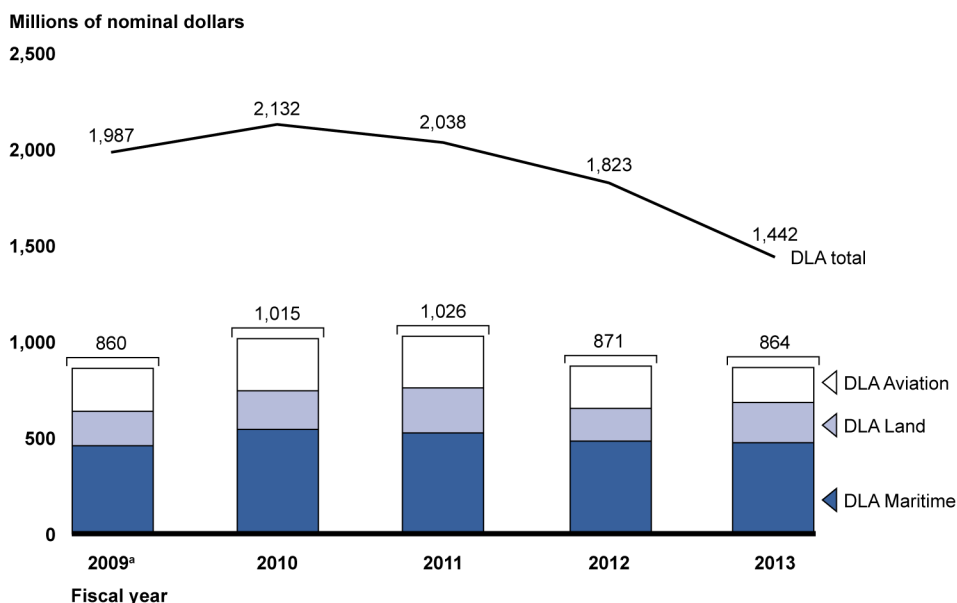
DLA Has Reduced the Value and Number of Backorders since Fiscal Year 2010

Since fiscal year 2010, DLA has made progress reducing backorders—part shortages that can affect the readiness of operational units as well as delay work at maintenance depots—through intensive management practices, such as monthly reviews of backorders. It is DOD policy that DOD supply-chain management organizations, such as DLA, be responsive to customer requirements.⁵⁹ DLA maintains its responsiveness to customer requirements in part by monitoring and mitigating its backorders. GAO’s analysis of DLA data shows that the value of backorders has decreased by about \$700 million overall from \$2.1 billion at the end of fiscal year 2010 to about \$1.4 billion at the end of fiscal year 2013. As part of this total amount, the aviation, land, and maritime supply chains have collectively reduced their backorders by about \$136 million from about \$1.0 billion in fiscal years 2010 and 2011 to \$864 million in fiscal year 2013, just over the level of 2009. The remaining \$564 million in reductions came from other DLA supply chains. Figure 6

⁵⁹DOD Instruction 4140.01, *DOD Supply Chain Materiel Management Policy*.

identifies the respective values of backorders for the aviation, land, and maritime supply chains.

Figure 6: Value of Defense Logistics Agency (DLA) Backorders, End of Fiscal Years 2009-2013



Source: GAO analysis of DLA data. | GAO-14-495

^aEnd of the fiscal year 2009 inventory data were not available, so we used November 2009 data.

DLA has established supply chain-specific goals for reducing the number of backorders to make improvements in the availability of materiel to its customers. According to DLA headquarters officials, DLA senior management developed the backorder goals based on an assessment that there were too many backorders and action needed to be taken to reduce them. Thus, the DLA Director issued guidance establishing the backorder goals. Specifically, using January 2012 figures as a baseline, DLA established a goal of reducing the number of backorders by 25 percent by the end of fiscal year 2013. Furthermore, DLA established a goal to limit the number of aged backorders—backorders that have existed for longer than 180 days—by 15 percent of its total number of backorders in January 2012. These are overall goals for DLA, but each supply chain also was held accountable to achieve the same percentage reductions in the number of backorders and aged backorders based on the January 2012 baseline. For example, the aviation supply chain end of fiscal year 2013 goal was to have fewer than about 103,000 backorders and fewer than 21,000 aged backorders in any given month. As of the

end of fiscal year 2013, the aviation supply chain had reduced the total number of its backorders and aged backorders during the previous 6 months, but had not yet met its goals. On the other hand, the land supply chain individually met the goal for the number of backorders and aged backorders, though the maritime supply chain has not. Table 4 shows the specific backorder data by supply chain through September 2013.

Table 4: Total Backorders and Aged Backorders versus Command Goals as of September 2013

Supply chain	Total backorders	Goal for total backorders	Met goal for total backorders	Aged backorders	Goal for aged backorders	Met goal for aged backorders
Aviation	112,449	102,262	No	38,222	20,452	No
Land	47,706	51,932	Yes	9,537	10,387	Yes
Maritime	53,891	53,721	No	14,761	10,744	No

Source: GAO analysis of Defense Logistics Agency (DLA) data.

While only one of the three supply chains above has met both of their goals, DLA has reduced the value and number of backorders through intensive management oversight. Senior DLA management, such as the DLA Director and Vice Director, and the senior management of the aviation, land, and maritime supply chains regularly review progress made in reducing backorders. The DLA Director reviews backorder metrics on a quarterly basis while other senior DLA managers review backorders monthly. Additionally, DLA's logistics operations directorate holds a monthly meeting, which is focused on understanding and addressing key backorder drivers across the enterprise. Senior managers at the supply chains are also briefed monthly on the status of efforts to reduce backorders.

Finally, the DLA Director has challenged the supply chains to reduce the number of backorders by 25 percent from the backorder levels reported in September 2013. Additionally, the DLA Director established a new goal to limit the number of aged backorders by 15 percent of its total number of backorders in September 2013 and have no aged backorders over 3 years old.

DLA Is Implementing Efforts to Improve Inventory Management but Can Strengthen Collaborative Forecasting

DLA is implementing a number of efforts aimed at reducing excess inventory and backorders; however, DLA has not established return-on-investment metrics and does not hold regular performance-management reviews to monitor and evaluate the performance of its collaborative forecasting effort. Collaborative forecasting allows DLA and the military services to work together with the intent of developing more-accurate demand forecasts for items. However, DLA has not used a comprehensive approach to managing, evaluating, and improving the performance of collaborative forecasting. DLA's other efforts—(1) implementing new methods to determine inventory levels for items with low or highly variable demand; (2) improving acquisition lead time accuracy and reducing acquisition lead times; and (3) improving the efficiency of supply, storage, and distribution processes—are in the early stages of implementation, and more time is needed to determine their effect. See appendix VIII for an overview of these three improvement efforts.

DLA and the Military Services Have Expanded the Use of Collaborative Forecasting

Since 2005, DLA, the Navy, and the Air Force have expanded collaborative forecasting to additional participating sites, and DLA and the Army are evaluating whether to use it to improve materiel support to the Army's industrial depots.⁶⁰ Through collaborative forecasting, DLA works with customers on selected items to evaluate historical demand data and tailor forecast plans. Participating customers select items for the program that they anticipate would benefit from collaborating with DLA on the development of a forecast rather than DLA solely relying on historical demand patterns to establish a forecast. For example, an item may be selected because requirements are expected to fluctuate.

As of February 2014, Navy and Air Force participating locations submitted collaborative forecasts for about 25,000 items at an annual forecasted value of about \$730 million.⁶¹

⁶⁰When we use the term "collaborative forecasting" we are referring specifically to the demand data exchange program operated by DLA. There are other types of collaborative forecasting that are used by DLA and the services, such as special program requirements. Special program requirements are nonrepetitive requirements for spare parts that cannot be forecast based on demand data and are submitted to DLA by the military services.

⁶¹According to DLA, using historical demand to predict the annual forecast for these items rather than using customer input through collaborative forecasting would have resulted in an annual forecast value of about \$378 million versus \$730 million.

In addition, DLA and the Army are currently analyzing the potential use of collaborative forecasting for tens of thousands of items by evaluating the Army collaborative forecast submissions in late 2013. However, at the time of our review, DLA had not made a final decision on whether to use collaborative forecasting with the Army after a preliminary analysis showed that it would require DLA to procure hundreds of millions of dollars in new stock and would increase the annual demand forecast for the participating locations by tens of millions of dollars.

DOD's *Comprehensive Inventory Management Improvement Plan* is focused, in part, on the improvement of demand forecast accuracy through expanding and refining its collaborative forecasting processes.⁶² According to DLA officials, collaborative forecasting should improve forecast accuracy by incorporating the customer's understanding of its future spare-part requirements, which theoretically should be more accurate than a forecast generated by DLA's enterprise resource-planning system that is based on historical demand trends.⁶³ Improving demand forecasting accuracy could improve the ability of DLA to meet military customer requirements in a financially prudent manner without accumulating unnecessary excess inventory or backorders for spare parts.

DLA's Analysis Shows That Collaborative Forecasting Is Less Accurate than DLA's Forecasts Based on Historical Demand

The actual performance of forecasts developed using collaborative forecasting has fallen short of expectations. DLA measures the performance of collaborative forecasts by evaluating improvements to demand forecasting accuracy and error, and its analysis shows that collaborative forecasts are less accurate and increase the error of the demand forecast when results are aggregated across all participating locations. While collaborative forecasts may be more accurate for some particular items, the process has not improved the aggregate accuracy of forecasts for the selected items when compared to the forecasts that

⁶²See app. I for a brief overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

⁶³If collaborative forecasting is not used to determine the amount of an item needed at a specified time, then DLA uses a number of other approaches to determine the amount of inventory needed. For items that are forecastable—items with regular and frequent demand patterns—DLA uses a mature enterprise resource-planning system as its demand forecasting solution. This approach relies on historical demand to project future needs. See app. IX for an overview of DLA's approaches to planning amounts of needed inventory.

would have been generated by DLA's enterprise resource-planning system using historical demand.

DLA and the participating military services measure the performance of collaborative forecasting in two ways. First, DLA compares the collaborative forecast against actual demands. Using the result of this comparison, DLA and the customer can evaluate the collaborative forecast submitted by the customer and make necessary adjustments to improve its accuracy. Second, DLA compares the collaborative forecast against the forecast that would have been generated by DLA's enterprise resource-planning system using historical demand.⁶⁴ DLA and the customer can use this comparison to determine if the collaborative forecast is improving forecasting accuracy and error.⁶⁵

To make these comparisons, DLA uses three metrics—demand plan accuracy, absolute percent forecast error, and net percent forecast error. See table 5 for a brief overview of DLA's forecast accuracy and error metrics. Each metric provides a different type of information for assessing demand forecasts.

⁶⁴Currently, this comparison for collaborative forecasts is made based on assessing the forecasted demand that was projected 1 month in advance. Ideally this comparison would be made by assessing the forecasted demand one lead time in advance; however, DLA does not currently maintain the necessary data to make this assessment. DLA's average lead time for an item is approximately 6 months. At the end of January 2012, DLA staff developed a system change request to make improvements in how these data are collected and managed; according to DLA officials, the change is not yet implemented in the DLA enterprise resource-planning system.

⁶⁵As part of the *Comprehensive Inventory Management Improvement Plan*, the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration commissioned a study on forecasting across the department that concluded in part that DLA and the military services should use forecast value-add metrics to establish controls around the proper use of collaborative forecasting. A forecast value-add metric, such as the one discussed here, measures the added benefit of collaborative forecasting against a traditionally determined forecast using historical demand. The study noted that such a metric would add transparency to the forecast creation cycle and provide the capability to identify processes that do not add value to the forecasting process.

Table 5: Defense Logistics Agency’s (DLA) Forecast Accuracy and Error Metrics

Metric	Information provided by metric	Level of analysis
Demand plan accuracy	Accuracy of the forecasted demand against actual demands over any given number of months, with a range from 0 to 100 percent, with 100 percent reflecting perfect accuracy.	Individual items or aggregate across multiple items
Absolute percent forecast error	Magnitude of the forecasting error over any given number of months, with 0 percent reflecting no error. This metric is dollar weighted, thus the error assists in understanding effects on business outcomes.	Individual items or aggregate across multiple items
Net percent forecast error	Direction—over (+) or under (-)—and magnitude of the forecasting error over any given number of months, with 0 percent reflecting no error. This metric is dollar weighted, thus the error assists in understanding effects on business outcomes.	Individual items

Source: GAO analysis of DLA information.

Aggregately for all Navy and Air Force participating sites from September 2011 to December 2013, DLA’s analysis shows that demand plan accuracy for the collaborative forecasts is about 7.0 percentage points less accurate on average per month than the forecast that would have been generated by DLA’s enterprise resource-planning system. Additionally, the same DLA analysis shows that absolute percent forecast error is approximately 120 percentage points higher on average per month for collaborative forecasts than for the forecast that would have been generated by DLA’s enterprise resource-planning system.⁶⁶ Furthermore, DLA reported that during fiscal year 2012 the demand forecast accuracy improved for only 37 percent of the items using a collaborative forecast. The procurement of inventory for these 37 percent of items was valued at \$218 million, which was slightly less than one-third of the total value—\$702 million—of inventory procured through a collaborative forecasting approach. Thus, collaborative forecasting did not improve, or resulted in less-accurate forecasts, for 63 percent of the items, valued at \$483 million.

Implementation of a new collaborative forecasting process, referred to as gross demand planning, has improved demand plan accuracy and outperformed DLA’s enterprise resource-planning system at one Navy site over the last several months of 2013 and early 2014. DLA developed the gross demand plan process as a solution to improve customer

⁶⁶Absolute percent error forecast is weighted by dollar value of the forecast.

collaboration, such as improving collaborative planning approaches for low-demand items. According to DLA officials, as implementation moves forward with other Navy sites, they are evaluating the option of using gross demand planning with the Army and Air Force.

DLA Lacks Comprehensive Metrics and Regular Performance-Management Meetings to Guide Improvement

Outside of measuring for improvements to demand forecasting accuracy and error, DLA does not regularly use other performance metrics or have regular performance-management meetings to guide improvement. Specifically, DLA does not regularly use performance metrics, such as costs or return on investment, to evaluate the performance of collaborative forecasting across the enterprise. DOD guidance requires DLA to adopt metrics that evaluate the performance and cost of supply-chain activities, including monitoring the efficient use of resources and assessing costs versus benefits of supply-chain operations.⁶⁷ Furthermore, DOD guidance requires DLA to establish internal controls, such as performance measures, to ensure investment in inventory resulting from collaborative forecasting does not lead to excessive growth in inventory.⁶⁸

Additionally, DLA has not used a comprehensive approach to managing, evaluating, and improving the performance of collaborative forecasting. In our prior work examining leading practices in results-oriented management, we found that leading organizations use performance information to monitor and evaluate program performance through frequent, regular performance-review meetings to discuss progress made toward the achievement of results, identify performance problems, and develop performance-improvement plans to achieve program goals.⁶⁹ DLA does not regularly evaluate the results of collaborative forecasting across the enterprise through its performance-management meetings. Prior to February 2013, DLA headquarters held performance meetings with the individuals responsible for collaborative forecasting programs at the supply chains, but these meetings were suspended to redirect

⁶⁷DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting*.

⁶⁸DOD Manual 4140.01, Volume 2, *DOD Supply Chain Materiel Management Procedures: Demand and Supply Planning*.

⁶⁹See [GAO-13-228](#), [GAO-05-927](#), and *Government Operations: Internal Control Management and Evaluation Tool*, [GAO-01-1008G](#) (Washington, D.C.: August 2001).

resources to implementing collaborative forecasting with the Army and the gross demand planning process with the Navy. DLA officials have noted that they intend to begin holding regular performance meetings in the near future on collaborative forecasting to ensure collaboration across supply chains as well as to monitor performance comprehensively. While DLA has some information available, such as the lack of improvements made to demand forecasting accuracy by the program, it has not developed efforts to improve collaborative forecasting across the enterprise. Officials told us that there are ongoing discussions about expanding gross demand planning to the Air Force and Army, but there are no official plans to guide and monitor this improvement effort. Also, officials stated that they intend to address other improvement efforts, such as automating and expanding across the enterprise a collaboration scorecard used with the Marine Corps' depots to provide period performance updates on the accuracy of collaborative forecasts. However, without regular performance-management meetings on collaborative forecasting, it will be difficult for these efforts to achieve their potential and improve performance.

DLA currently projects that it will procure approximately \$730 million in inventory using collaborative forecasts from March 2014 to March 2015 and could potentially need to procure hundreds of millions of dollars of additional inventory as a result of collaborative forecasting with the Army, based on its preliminary analysis. This is a significant investment of resources, but DLA does not have a suite of metrics and regular performance-management meetings for its collaborative forecasting program to comprehensively evaluate results and make improvements. Furthermore, as noted above, DLA's analysis indicates that collaborative forecasts do not improve demand forecasting accuracy and error in the aggregate. Improving demand forecasting accuracy and error could directly improve the ability of DLA to meet military customer requirements in a financially prudent manner without accumulating unnecessary excess inventory or backorders for spare parts. Without a suite of metrics to evaluate the program and regular performance-management meetings that help it to develop and implement the necessary steps to monitor and improve the program's results, it will be difficult for DLA and the military services to know whether the program is improving supply-chain management performance, providing an adequate return on its investments, and taking the necessary corrective actions to improve results.

Conclusions

Effective and efficient management of DOD's inventory is critical to supporting the readiness of the force, and requires a balanced approach. To be effective as a key supply-chain organization that manages billions of dollars in inventory, DLA must have the correct amount of spare parts on hand at the correct time to support the fighting force, but it must also manage its inventory efficiently to avoid the unnecessary and wasteful accumulation of secondary inventory that could divert resources away from defense priorities. While DLA has made progress reducing on-hand inventory that it can no longer justify retaining, such as contingency retention stock, and making other improvements to its inventory-management efforts, DLA has a number of issues that are hindering progress toward achieving a balanced approach. First, without reassessing its goals and schedule for reducing on-hand inventory in accordance with its economic retention analyses, DLA's attempt to meet its fiscal year 2014 goal could again result in the disposal of inventory that should have been retained due to its likelihood of being bought again. Second, maintaining progress toward goals is often aided by ongoing management attention to relevant performance measures and oversight of processes. Ensuring progress in reducing on-order excess inventory will require high-level attention within DLA, and without regular review at senior management meetings, performance monitoring through DLA's new automated reporting system, and supply chain-specific goals and related metrics, DLA leadership will have limited insight into what areas are in need of further focus and effort. Third, although DLA has taken some steps intended to improve demand forecasting, its collaborative forecasting effort has not yet resulted in better performance than DLA's traditional forecasting methods. Without metrics that evaluate multiple aspects of performance, such as costs and accuracy, and a more-intensive management approach, such as regular performance-management meetings, it is unclear whether DLA will be able to improve its collaborative forecasting effort and aggregate forecasting accuracy.

Without changes to the measurement and oversight of DLA's efforts to reduce excess inventory and improve its forecasting, DOD will continue to face challenges in assuring that it can meet the inventory needs of the warfighters in an efficient and cost-effective manner. At a time when DOD can reasonably anticipate ongoing fiscal pressure, it is especially important for DLA to avoid inefficient use of taxpayer dollars or putting the department's readiness at risk.

Recommendations for Executive Action

To ensure that DLA does not dispose of inventory that is more economic to keep, in accordance with DOD guidance, we recommend the Secretary of Defense direct the Director, DLA, to reassess and, if determined appropriate, revise DLA's 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.

To improve management and minimize the amount of on-order excess inventory, consistent with federal standards for internal control and leading practices for performance management, we recommend the Secretary of Defense direct the Director, DLA, to take the following four actions:

- regularly monitor progress reducing on-order excess inventory through DLA's senior management performance briefings;
- track and regularly review performance data, such as the amount of on-order excess inventory reviewed, modified, or cancelled, and the reasons for not modifying or cancelling, in its on-order excess inventory management processes through its newly established automated report;
- establish supply chain-specific on-order excess goals that support DLA minimizing its investment in inventory that is not needed to meet requirements and achieving the DOD goal of 4 percent of the total value of on-order inventory by the end of fiscal year 2016; and
- monitor on a regular basis DLA's progress toward achieving the supply chain-specific goals.

To ensure DLA is improving its collaborative forecasting effort, in accordance with DOD guidance that emphasizes monitoring the efficient use of resources and leading practices for results-oriented management, we recommend that the Secretary of Defense direct the Director, DLA, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Secretaries of the Army, Navy, and Air Force, to take the following three actions:

- develop metrics, in addition to currently developed demand forecast accuracy and error metrics, that allow DLA and the services to evaluate whether the program is improving supply-chain management performance and providing an adequate return on its investments;

-
- use these metrics to monitor the performance of collaborative forecasting across DOD through a results-oriented management approach, such as regular performance management meetings; and
 - develop and implement the necessary corrective actions to improve the results of collaborative forecasting across DOD.

Agency Comments and Our Evaluation

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

DOD concurred with our recommendation for DLA to reassess its 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. DOD stated that it will continue to reassess the on-hand inventory-reduction goals and anticipates additional changes to these goals at future senior-management performance meetings.

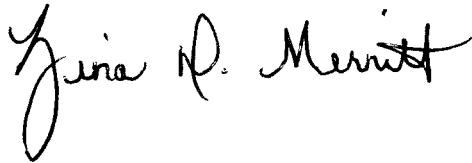
DOD concurred with our four recommendations aimed at improving the management of on-order excess inventory and minimizing the amount of on-order excess inventory. DOD stated that DLA senior management will review progress reducing on-order excess inventory and other on-order excess-inventory metrics, such as the amount of on-order excess inventory reviewed, modified, and cancelled, and the reasons for not modifying and canceling, on a quarterly basis. Additionally, DOD stated that DLA will establish and monitor supply chain-specific on-order-excess inventory goals by August 2014.

DOD concurred with our three recommendations aimed at improving collaborative forecasting between DLA and the military services. DOD stated that DLA, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Secretaries of the Army, Navy, and Air Force, will evaluate the effectiveness of current forecasting performance metrics, modify current logic as needed, and develop additional metrics as appropriate. Also, DOD stated that DLA will monitor collaborative forecasting performance against other approaches, such as statistical forecasting, at regular performance-management meetings. Lastly, DLA, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Secretaries of the Army, Navy, and Air Force, will develop corrective

actions for collaborative forecasting by November 2014, and implementation of these corrective actions will occur in coordination with the military services.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense, the Director of DLA, and the Secretaries of the Army, Navy, and Air Force. 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 or (202) 512-5257. GAO staff who made key contributions to this report are listed in appendix XII.



Zina D. Merritt
Director
Defense Capabilities and Management



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.

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.

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

Goals of the Plan

The plan has two overarching goals, which are to reduce (1) total on-order excess inventory 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 to 8 percent of the total value of inventory by the end of fiscal year 2016.

The Structure of the Plan

To achieve the plan's goals, DOD developed nine sub-plans 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 ^a and multiechelon modeling ^b	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 DLA justify the retention of contingency retention stock.
6. Storage and direct vendor delivery ^c	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: DOD's 2010 *Comprehensive Inventory Management Improvement Plan* and its supporting documents.

^aTotal 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.

^bMultiechelon 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.

^cDirect 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.

Appendix II: The Defense Logistics Agency's Metrics Generally Balance Availability of Spare Parts and Total Supply-Chain Costs

Defense Logistics Agency (DLA) metrics generally manage to balance availability of spare parts with total supply-chain costs, in accordance with Department of Defense (DOD) guidance. DLA uses a metrics framework to comprehensively assess the performance of its inventory-management activities. Furthermore, DLA reviews these metrics at regular intervals through a series of performance-management meetings that take place at the Director, headquarters, and supply-chain levels.

DLA Has a Metrics Framework That Covers Key Inventory Areas

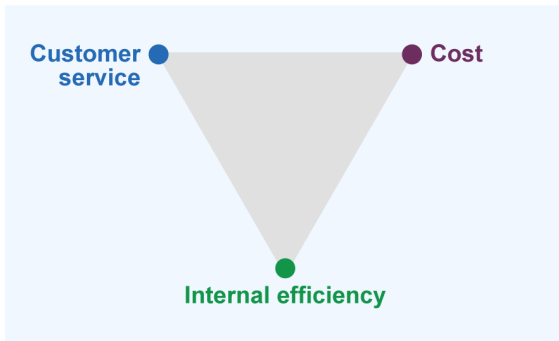
DLA has a metrics framework that it uses to assess its overall performance on a regular and consistent basis. This framework addresses a wide spectrum of DLA's operations and balances a number of metric areas, such as customer service, cost, and internal efficiency.¹ Furthermore, the framework provides flexibility to allow the DLA Director and senior managers to focus the agency on specific performance areas. For example, the current Director has focused the agency generally on customer service and internal efficiency metrics by holding the supply chains responsible for meeting certain performance goals with respect to those metrics.

DOD guidance requires DLA, the military services, and other supply-chain organizations to be responsive to customer requirements while balancing risk and total cost, conduct periodic performance and cost evaluations, and adopt metrics that provide information on customer service, cost, and internal efficiency.² DLA evaluates its supply chain by looking at multiple metrics in the key areas of customer service, cost, and internal efficiency. See figure 7 for an overview of DLA's metrics in the key areas.

¹Customer-service metrics measure things like the availability of parts or the number of backorders. Cost metrics can measure agency cash flow, sales versus purchases, or cost-efficiency measures such as on-order excess. Finally, internal efficiency metrics assess things like the number of purchase requests and the administrative lead time required to make an award.

²DOD Instruction 4140.01, *Supply Chain Materiel Management Policy* (December 2011), and DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting* (February 2014).

Figure 7: Overview of DLA's Metrics in Customer Service, Cost, and Internal Efficiency Areas



OPTIMAL: The tradeoffs between parts availability, costs, and internal efficiency are being actively managed, which results in a balance between metrics areas, which can be seen as an indicator of a healthy supply chain.

EXAMPLES OF POTENTIAL IMBALANCES:

- Customer service metrics are prioritized, which means better parts availability for customers and reduced backorders. The additional inventory increases the potential for excess, but can positively affect readiness. However, because of increased parts purchases and storage costs, as well as the increased potential for excess, cost metrics are now performing poorly.
- Cost metrics are prioritized. Because of reduced costs, the organization is currently stocking fewer parts. This increases the amount of time that customers have to wait for parts, as well as the likelihood of backorders. The supply chain is now operating using less money at the expense of reduced parts availability.

Source: GAO. | GAO-14-495

A balanced approach across these key areas is important because without it any given metric could be optimized at the expense of other metrics. For example, a supply chain could achieve a high availability of parts if it was less focused on the costs of purchasing excess materiel and storing it. Alternatively, a supply chain could significantly reduce its costs if it was less focused on the resultant effect on parts availability and readiness. Effects on customer service can also affect readiness. For example, if a customer does not have a part that is needed, then this could have effects on the availability of a weapon system or the efficient functioning of a military depot that is trying to repair a weapon system.

DLA uses a number of metrics to assess its customer service. Materiel availability is the primary metric it uses to measure whether customers are getting the right parts at the right time; the current agency-wide goal for this metric is 90 percent.³ The agency also closely tracks backorders, including both the number and the age of backorders. Materiel availability and backorders have been identified as key metrics by the DLA Director, who has provided supply chain-specific goals through departmental guidance for each of these metrics and regularly monitors progress against these goals. Additional metrics used by DLA to assess customer service include on-time delivery and order response time.

³One of the supply chains that we did not review, industrial hardware, has a materiel availability goal of 93%.

DLA also has several key metrics that it reviews regularly in order to assess its cost performance. These cost metrics measure the net operating result, cash plan performance, and the number of days of cash remaining in the working capital fund.⁴ DLA also looks at the amount of the obligation authority provided by Congress. Several of these cost metrics are assessed regularly through internal reviews, while others, such as obligation authority, are used to help inform analysis of potential inventory improvements. In addition, the direct costs of making changes to DLA's processes are another way in which costs are considered. For example, at an inventory-management meeting in November 2013, a number of cost-related issues were discussed, such as the potential effect of different pricing mechanisms for storage costs and the trade-off of improving materiel availability at the expense of increasing the amount of inventory purchased. Finally, as noted earlier, DLA also has the ability to track on-order excess—a cost-efficiency metric—but this metric is not regularly reviewed except at the aviation supply chain. Further details about on-order excess inventory are discussed earlier in this report.

In addition to customer service and cost metrics, DLA has a number of internal efficiency metrics that it uses to assess its internal processes and identify potential workload backlogs. Two of the most critical to current DLA management are the backlog and age of purchase requests.⁵ DLA management has also used recent departmental guidance to set a goal of reducing the backlog and age of purchase requests by reducing the administrative lead times associated with these requests. Additional DLA

⁴A 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. The net operating result is the overall gains and losses to the working capital fund from sales, while the cash plan performance measures increases or decreases to the cash flow of the working capital fund.

⁵A purchase request is a requisition for an item that has not yet been placed on order.

metrics look at the percentage of automated awards and the amount of funds obligated through long-term contracts.⁶

The metrics framework at DLA can be adjusted as needed. For example, DLA has a web-based tool that provides managers at all levels with the ability to see on a daily basis how a given supply chain or individual unit within a supply chain is performing against key performance and cost metrics. This tool focuses on key metrics as identified by the Director and those performance metrics that DLA committed to meet through performance-based agreements it has made with the services.⁷ According to DLA officials, additional metrics could be added to the web-based tool with relatively little effort whenever necessary, thereby giving DLA an additional option for emphasizing specific performance metrics.

DLA Reviews Its Metrics in Regular Performance-Management Meetings at Multiple Levels within the Organization

DLA's metrics are regularly reviewed at multiple levels within the organization. The DLA Director, other senior managers at DLA headquarters, and the commanders and senior managers of the aviation, land, and maritime supply chains review the metrics through a number of regularly scheduled performance-management meetings. While there are no single meetings at which all of DLA's metrics are discussed, the regularly recurring meetings ensure that metrics that cover key areas of inventory management, such as customer service, cost, and internal efficiency, are reviewed.

For example, one of the key metrics briefings is the Agency Performance Review. This review includes DLA's key customer-service, cost, and internal-efficiency metrics, such as net operating result, days of cash in the working capital fund, materiel availability, backorders, and purchase request workload. The metrics in this review are briefed monthly at the supply-chain and DLA headquarters levels. Furthermore, the DLA

⁶Automated awards are those awards that do not require manual efforts on the part of DLA supply managers to award. A higher percentage of automated awards generally implies a lower administrative workload. Similarly, items on a long-term contract—here meaning between 3 and 5 years—generally have a lower administrative lead time and result in decreased administrative workload.

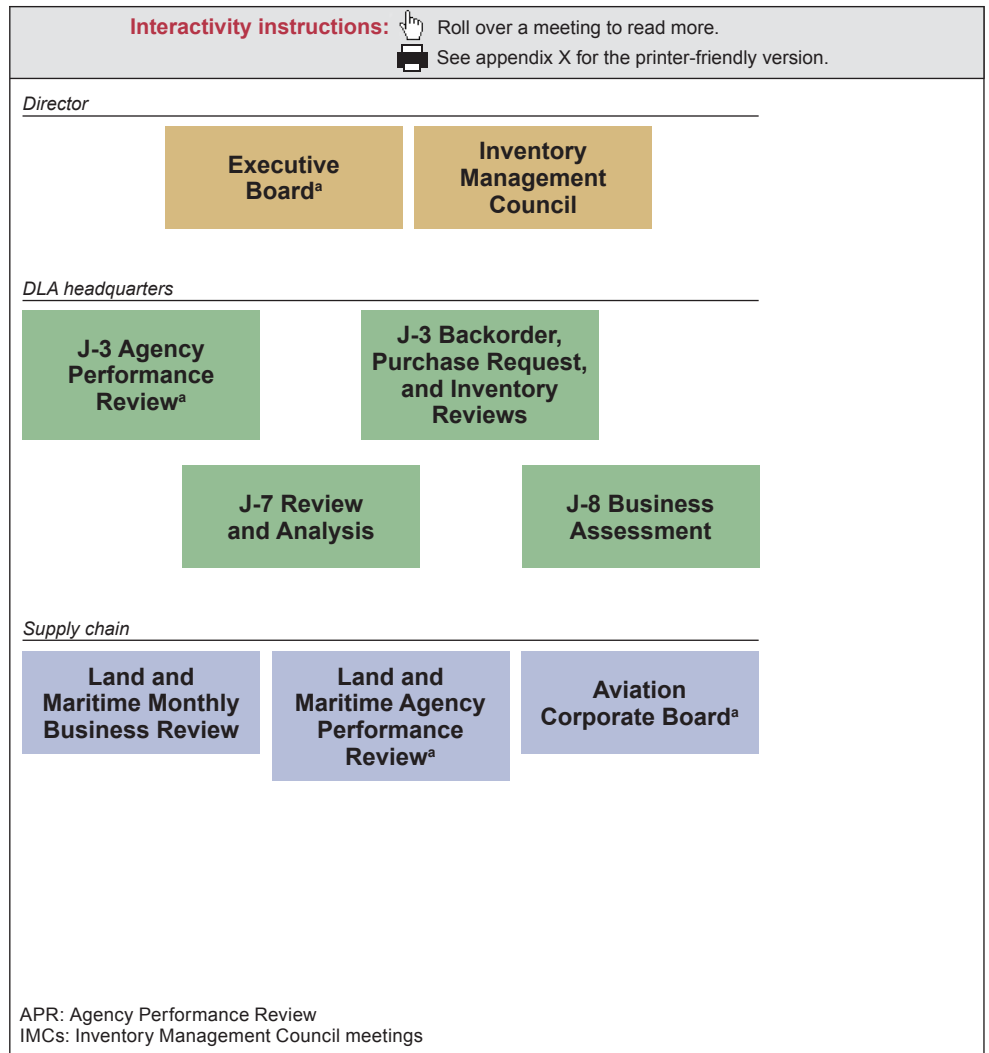
⁷A performance-based agreement is a contract between DLA and one of the military services that establishes a framework for the coordination and alignment of resources to support that service's mission. In addition to specifying each organization's roles and responsibilities, these agreements also include the metrics and goals that DLA and the service have agreed to use to assess supply-chain performance.

Director receives monthly updates on the metrics, in addition to conducting a more in-depth review of the Agency Performance Review metrics each quarter as part of the Executive Board meeting. These reviews provide the DLA Director with a consistent structure to assess performance according to established metrics, and also allow for special attention to specific issues as they arise. For example, officials told us that one metric was added to the Agency Performance Reviews for the DLA Director when there were concerns about a particular aspect of performance. That metric was removed once those concerns were addressed. However, one metric—the percentage of on-order excess inventory—is not included in the Agency Performance Review even though it is one of two metrics the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration is using to measure progress in addressing inventory management practices. Further details on monitoring on-order excess inventory are discussed earlier in this report.

In addition to the Agency Performance Reviews, the DLA Director, senior DLA managers, and supply-chain representatives review and analyze inventory-management performance-specific and cost-related issues at approximately monthly meetings. These inventory-management council meetings are flexible, and contain a mixture of recurring and onetime discussions that can touch on any number of inventory-management issues. For example, almost every council meeting since February 2013 has included an update on the status of the inventory reduction effort. In contrast, only two of the meetings since February 2013 have discussed the on-order excess metric.

DLA headquarters elements hold additional metrics meetings to review DLA's performance. For example, the DLA headquarters element focused on acquisition conducts a monthly review and analysis meeting where it reviews procurement metrics, such as the use of long-term contracts for procuring spare parts, contract review time, and additional metrics related to contract compliance. The DLA headquarters element focused on finance, meanwhile, regularly provides updates on financial metrics to key personnel. Finally, the DLA headquarters element focused on logistics operations conducts additional meetings focused on those metrics that are of interest to management—backorders, amount of on-hand inventory, and purchase request workload. See figure 8 for an overview of DLA's regular performance-management meetings. Appendix X provides a printer-friendly version of figure 8.

Figure 8: Overview of Defense Logistics Agency's (DLA) Regular Performance-Management Meetings



Source: GAO analysis of DOD guidance and inventory practices. | GAO-14-495

^aFocus on Agency Performance Review (APR) metrics

**Appendix II: The Defense Logistics Agency's
Metrics Generally Balance Availability of Spare
Parts and Total Supply-Chain Costs**

In addition to the meetings held at DLA headquarters, metrics are also regularly reviewed at the supply chains. For example, the aviation, land, and maritime supply chains use the Agency Performance Review metrics in their own regularly scheduled supply-chain meetings. The aviation supply chain supplements the agency performance metrics with additional supply chain-specific metrics in its monthly Corporate Board meetings. These additional metrics allow aviation supply-chain managers to assess areas of performance that might otherwise not be captured by the agency-wide metrics. Some of these metrics include potential backorders, production and administrative lead times, and on-order excess inventory. The land and maritime supply chains supplement their monthly command review of the agency performance metrics with an additional monthly business review, which alternates month-to-month looking at DLA's land and maritime supply-chain distribution detachments. The metrics contained in these reviews alternate as well, and cover production and administrative lead times, materiel availability, as well as additional metrics pertaining to the service performance-based agreements.

Appendix III: Objectives, Scope, and Methodology

To assess the extent to which the Defense Logistics Agency (DLA) has developed and met goals to reduce on-hand inventory and on-order excess inventory while reducing shortages and any implementation challenges, we analyzed DLA inventory data as of the end of November 2009 and every subsequent September 30 for fiscal year 2010 through 2013.¹ The Department of Defense (DOD) and DLA stratify inventory into categories to assess the ability of the inventory to meet the stated requirements and ensure that surplus inventories are kept only if warranted. In our analysis, we focused on the data associated with DLA's aviation, land, and maritime supply chains since these supply chains comprised \$9.8 billion of DLA's \$13.1 billion nonenergy inventory at the end of fiscal year 2012.² To assess the reliability of the data, we reviewed DOD requirements for secondary spare-parts inventory reporting, comparing the data we generated from DLA-provided electronic files to its summary tables, searching for and reconciling inconsistent information (e.g., out-of-range and missing data), and discussing DLA's data and our findings with database managers. We determined the inventory data were sufficiently reliable for the purposes of determining DLA's amount of inventory and reasons for holding that inventory. Using the inventory data, we determined DLA's total amount of on-hand inventory and categorized this on-hand inventory by the reasons DLA was retaining it, such as economic or contingency reasons. It is important to note that our analysis reflects points in time over the approximate 5-year period we reviewed and that requirements and inventory levels are constantly fluctuating.

With respect to on-order excess inventory, we analyzed DLA's inventory data from fiscal year 2011 through fiscal year 2013 to determine the amount of on-order excess inventory, and examined DLA's efforts to minimize on-order excess. We compared DLA's amounts of on-order excess inventory against DOD's goals for reducing on-order excess inventory in its *Comprehensive Inventory Management Improvement*

¹DLA and the military services are required to stratify and report inventory data biannually as of March 31 and September 30 and use the stratification data to assess the ability of the inventory to meet the stated requirement and ensure that surplus inventories are kept only if warranted. Secondary inventory data are stratified by item, each of which is assigned a unique stock number. DLA may have in its inventory multiple quantities (parts) of each unique item. 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).

²Unless otherwise stated, all dollar figured in this report are in nominal terms.

Plan. Additionally, we reviewed DLA's process for managing and overseeing on-order excess inventory and compared these processes against leading practices for results-oriented management.³ With respect to shortages (i.e., backorders) of spare parts, we reviewed DLA-generated reports on backorders to assess the status and extent of its efforts to reduce the number of backorders and aged backorders (i.e., backorders more than 6 months old) in addition to the analysis of DLA's inventory data previously described above. Also, we reviewed DLA's aviation, land, and maritime goals for reducing backorders and evaluated DLA's progress in meeting those goals.

To supplement our analysis of DLA's inventory data, we examined DLA performance-management briefings; documentation related to DLA's effort to reduce its on-hand inventory, on-order excess inventory, and backorders; DOD and DLA inventory-management policies and procedures; and other reports and analyses related to the potential for buying inventory again after it is disposed of. Specifically, we compared DOD policies on using economic analyses to determine inventory that is more economical to keep than dispose of with DLA's procedures and processes and DLA's decision to dispose of items that its analyses deemed more economical to keep.⁴ We interviewed DLA headquarters and aviation, land, and maritime supply-chain officials to discuss DLA's efforts to reduce on-hand inventory, on-order excess inventory, and backorders. Additionally, we met with Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration officials to discuss DLA's efforts to improve its inventory management.

To assess the extent to which DLA has implemented initiatives using a comprehensive management approach to improve inventory management, we identified improvement efforts through interviewing DLA headquarters officials and Office of the Deputy Assistant Secretary of

³GAO, *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); *Managing For Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005); and *Agency Performance Plans: Examples of Practices That Can Improve Usefulness to Decisionmakers*, [GAO/GGD/AIMD-99-69](#) (Washington, D.C.: Feb. 26, 1999).

⁴DOD Manual 4140.01, Volume 6, *DOD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition*.

Defense for Supply Chain Integration officials. We focused on four key efforts DLA officials identified as significant for reducing excess inventory: collaborative forecasting, inventory level-setting for items with low or highly variable demand, improving acquisition lead-time accuracy and reducing acquisition lead times, and improving the efficiency of DLA's supply, storage, and distribution processes. Across the four areas, we analyzed DLA's efforts in the following manner:

- Collaborative forecasting: We analyzed DLA's collaborative forecasting—a process that allows DLA and the military services to work together to tailor forecast plans for items rather than DLA establishing a forecast based solely on historical demand patterns—by reviewing DLA's collaborative forecasting metrics to evaluate the extent its metrics addressed performance and costs, as required by DOD guidance.⁵ Additionally, we reviewed and analyzed DLA's management approach for the program to determine if it followed leading practices for results-oriented management, such as the need to have regular performance-management meetings to guide continued improvement.⁶ We discussed the metrics and the assessment methodology DLA uses for tracking and evaluating collaborative forecasting with DLA headquarters and supply-chain officials. We also discussed the challenges and weaknesses of the metrics for assessing collaborative forecasting with various DLA officials.
- Inventory level-setting for items with low or highly variable demand: We conducted interviews with officials at the DLA headquarters level and aviation, land, and maritime supply chains, to understand the rationale behind implementing a new method—referred to as Peak and Next-Gen—to set inventory levels for items with low or highly variable demand; the anticipated benefits of the new method; the implementation of the new method; and the plan for assessing the method's effectiveness. Finally, we reviewed DLA's analysis comparing Peak and Next-Gen against other level-setting methodologies, as well as data provided by DLA on the current

⁵DOD Manual 4140.01, Volume 10, *DOD Supply Chain Materiel Management Procedures: Metrics and Inventory Stratification Reporting* and Volume 2, *DOD Supply Chain Materiel Management Procedures: Demand and Supply Planning* (Feb. 10, 2014).

⁶See [GAO-13-228](#), [GAO-05-927](#), and GAO, *Government Operations: Internal Control Management and Evaluation Tool*, [GAO-01-1008G](#) (Washington, D.C.: August 2001).

metrics being tracked to assess the implementation of Peak and Next-Gen.

- Acquisition lead times: We reviewed and analyzed documents and guidance on the goal of efforts to improve the accuracy of acquisition lead times and reduce the actual acquisition lead times to improve inventory planning. Also, we reviewed planning documentation to understand the rationale and intended outcomes of the efforts; status update briefings to analyze progress in implementing the efforts; and the metrics used to assess the effectiveness of these efforts. Lastly, we conducted interviews with officials at DLA headquarters, as well as at the aviation, land, and maritime supply chains, to supplement our understanding of DLA's efforts.
- The efficiency of DLA's supply, storage, and distribution processes: We analyzed documents and briefings to determine the intended purposes of the strategic network optimization program, assess the current implementation status of the effort, and identify any upcoming challenges in implementation. Specifically, we examined the business plans, program status briefings, fiscal year 2013 annual report on strategic network optimization, and estimates of potential savings from implementation. We discussed the status of program implementation, as well as the methodologies and reasoning for proposed program savings with DLA and Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration officials.

To examine the extent to which DLA has implemented a framework of inventory management metrics that balances the timely availability of spare parts to customers and total supply-chain costs (discussion is in app. II), we analyzed DOD and DLA policies, regulations, and guidance pertaining to the use of metrics for the management of inventory at DLA. We reviewed briefing documentation from a number of different metrics meetings held at the DLA headquarters and supply-chain levels to understand which metrics were briefed on a regular basis. We also conducted interviews with officials at the DLA headquarters level, as well as at the aviation, land, and maritime supply chains, to understand how the metrics were used to help inform inventory decisions.

We conducted this performance audit from June 2013 to June 2014 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.

Appendix IV: Printer-Friendly Version of Figure 1—Selected Defense Logistics Agency (DLA) Categories of Inventory Items

Term	Definition
Potential reutilization stock	Materiel exceeding the approved acquisition objective and not being retained as economic or contingency retention stock, and has been identified as excess materiel for possible disposal but has potential for reutilization. Potential reutilization stock is also referred to as on-hand excess inventory.
Contingency retention stock	Materiel that is retained to support specific contingencies, such as to support foreign military sales, future military operations, and disaster relief or civil emergencies, or to mitigate risk associated with diminishing manufacturing sources or nonprocurable stock.
Economic retention stock	Materiel that has been deemed more economical to keep than to discard because it is likely to be needed in the future.
Two years of forecasted demand	The projected amount of consumption of an item for the next 2 years.
War-reserve materiel	Items held by the Defense Logistics Agency at the request of the military services to meet unfunded war-reserve requirements.
Quantities for items with diminishing manufacturing sources	Items that are procured because they are no longer expected to be produced.
Economic order quantity	Quantity derived from a mathematical technique used to determine the lowest total variable costs to order and hold inventory.
Acquisition lead time quantity	Stock needed to cover acquisition lead times, which are made up of the administrative and production lead times.
Backorders	Customer-requisitioned materiel that is not immediately available to issue, but is recorded as a commitment for future issue.
Safety stock quantity	Amount of stock that is to be kept on hand in case of minor interruptions in the resupply process or fluctuations in demand.
Quantities for items with low, infrequent, or highly variable demand	Demand for items with low, infrequent, or highly variable demand cannot be forecast, but nevertheless need to be stocked.

Source: GAO analysis of Department of Defense (DOD) guidance and DLA inventory practices.



Why On-Hand Excess Inventory Matters

In addition to the money spent procuring items that are determined to be on-hand excess inventory, there are also costs incurred in handling, storing, processing, and disposing of excess items. Also, money used to purchase the excess item is not available to purchase other needed items because working capital funds rely on the sales of on-hand items to fund future purchases. This could negatively affect readiness by limiting availability of spare parts to military customers.

Key Terms

Approved acquisition objective:

The materiel needed to meet the requirements objective and 2 years of estimated future demand.

Economic retention stock:

Materiel that has been deemed more economical to keep than to dispose of because it is likely to be needed in the future.

Contingency retention stock:

Materiel that is retained to support specific contingencies, such as to support foreign military sales, future military operations, and disaster relief or civil emergencies.

On-hand excess inventory:

Inventory that is excess to the approved acquisition objective and is not being retained as economic or contingency retention stock.

Lead times: The length of time between the identification of a materiel requirement and the receipt of that materiel into the supply system.

Appendix V: Overview of Typical Causes of On-Hand Excess Inventory

On the basis of our¹ and third-party reports² on inventory management and discussions with Department of Defense (DOD) and Defense Logistics Agency (DLA) officials, we have identified three typical causes of on-hand excess inventory. We did not quantify the extent to which these causes are individually responsible for on-hand excess inventory.

1. Forecast Error: The forecast for an item may be inaccurate due to a number of factors. For example, demand planners may not have up-to-date information, such as maintenance plans for a weapon system, to appropriately adjust forecasts. Also, forecast approaches have not always appropriately matched the characteristics of items, resulting in too much inventory being ordered and the accumulation of on-hand excess inventory. For example, items with low and variable demand require different forecast approaches than items with regular and frequent demand.

2. Changes in Demand: The forecast could have been accurate based on the most up-to-date requirement, but demand changes after the item has been procured. For example, an item is procured based on a requirement and is categorized as part of the approved acquisition objective initially. Over the course of time, the demand for the item may decrease—due to changes in the type and pace of operations or changes in the maintenance plan following the time in which parts needed to be ordered—resulting in a decrease in the amount of the item that can be categorized under the approved acquisition objective, which results in stock being recategorized as economic retention stock, contingency retention stock, or on-hand excess inventory.

3. Long Lead Times: An item's lead time is used to calculate the appropriate reorder point. So, for example, if an item's recorded lead time is three months, then the reorder point will be set to cover an estimated three months worth of demands before the item breaches its safety stock. Long lead times, even when accurate, can potentially create excess due to the greater possibility for changes in demand over the course of the lead time period.

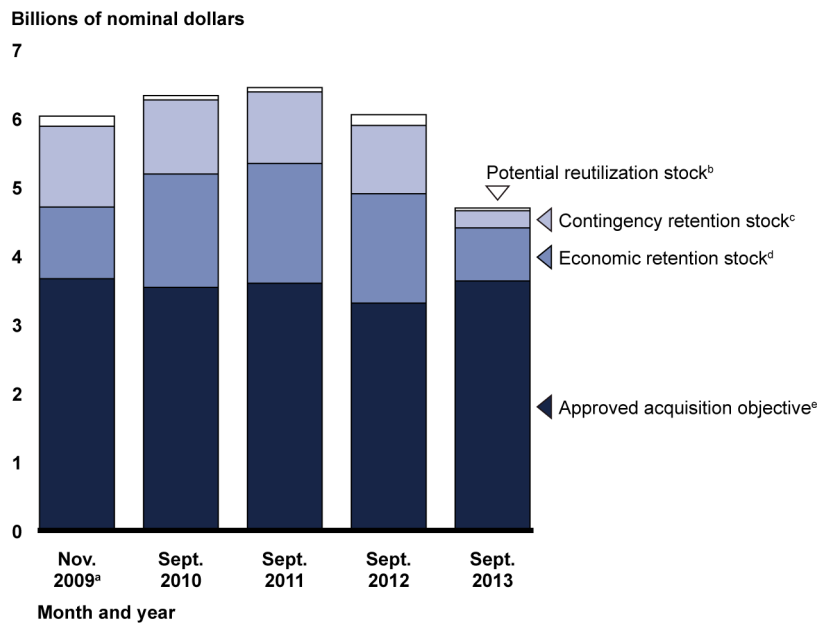
¹See GAO, *Defense Inventory: Actions Underway to Implement Improvement Plan, but Steps Needed to Enhance Efforts*, [GAO-12-493](#) (Washington, D.C.: May 3, 2012); *Defense Inventory: Defense Logistics Agency Needs to Expand on Efforts to More Effectively Manage Spare Parts*, [GAO-10-469](#) (Washington, 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); *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); *Defense Inventory: Opportunities Exist to Save Billions by Reducing Air Force's Unneeded Spare Parts Inventory*, [GAO-07-232](#) (Washington, D.C.: Apr. 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.: Mar. 2, 2007).

²LMI, *Lifecycle Forecasting Improvement: Causative Research and Item Introduction Phase* (November 2010) and RAND National Defense Research Institute, *Integrating the Department of Defense Supply Chain* (2012).

Appendix VI: On-Hand Inventory Levels for Aviation, Land, and Maritime Supply Chains

As part of the Defense Logistics Agency (DLA) efforts to reduce on-hand inventory, the aviation, land, and maritime supply chains each reduced their on-hand inventory from the end of fiscal year 2012 to the end of fiscal year 2013. See figures 9, 10, and 11 for the trends in the aviation, land, and maritime supply chains' on-hand inventory, specifically the amount of inventory being held as part of the approved acquisition objective or as economic retention stock, contingency retention stock, and potential reutilization stock.

Figure 9: Defense Logistics Agency's (DLA) Aviation Supply Chain On-Hand Inventory, End of Fiscal Years 2009-2013



Source: GAO analysis of DLA data. | GAO-14-495

^aEnd of the fiscal year 2009 inventory data were not available, so we used November 2009 data.

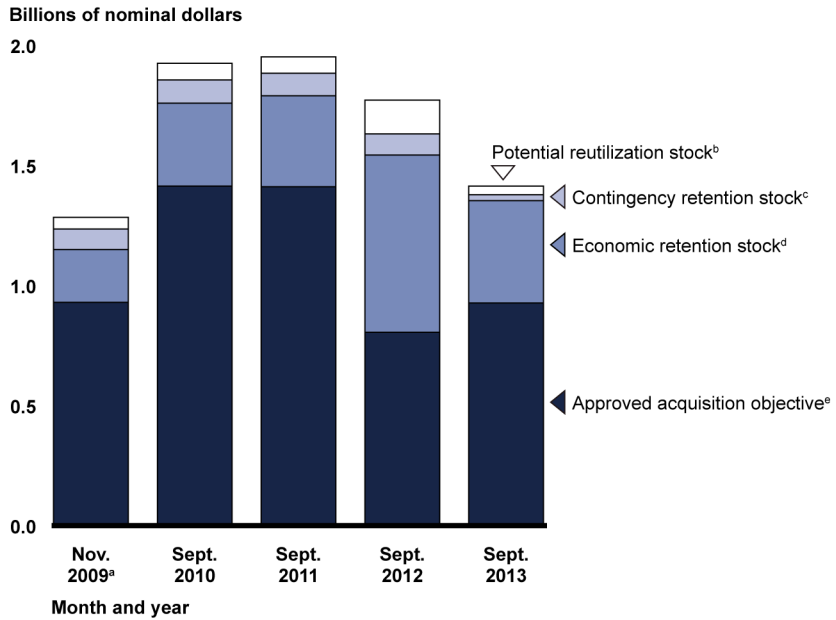
^bPotential reutilization stock is materiel exceeding the approved acquisition objective and not being retained as economic or contingency retention stock, and has been identified as excess materiel for possible disposal but has potential for reutilization. Potential reutilization stock is also referred to as on-hand excess inventory.

^cContingency retention stock is materiel that is retained to support specific contingencies, such as to support foreign military sales, future military operations, and disaster relief or civil emergencies, or to mitigate risk associated with diminishing manufacturing sources or nonprocureable stock.

^dEconomic retention stock is materiel that has been deemed more economical to keep than to discard because it is likely to be needed in the future.

^eApproved acquisition objective includes materiel needed to meet the requirements objective, 2 years of estimated future demand, war-reserve materiel held for the services, and materiel held because it comes from a diminishing manufacturing source.

Figure 10: Defense Logistics Agency's (DLA) Land Supply Chain On-Hand Inventory, End of Fiscal Years 2009-2013



Source: GAO analysis of DLA data. | GAO-14-495

^aEnd of the fiscal year 2009 inventory data were not available, so we used November 2009 data.

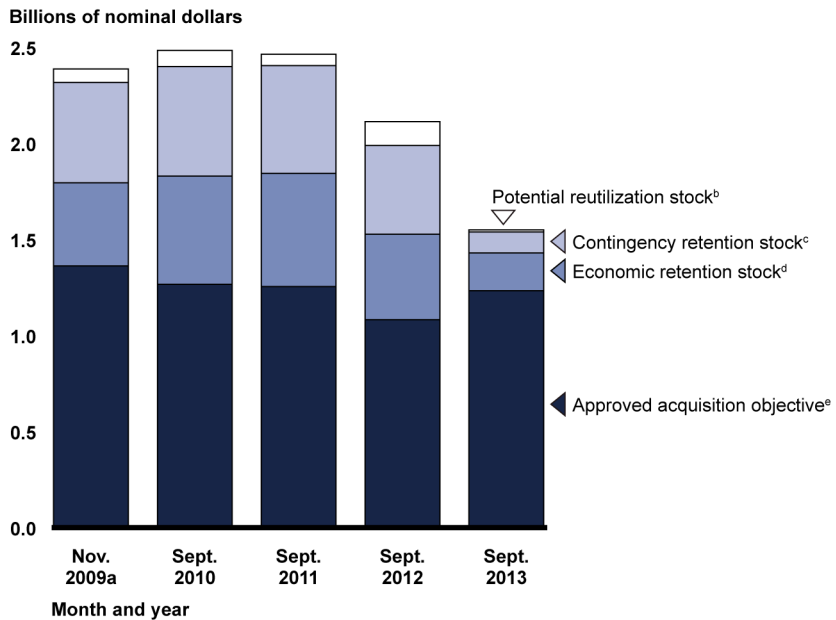
^bPotential reutilization stock is materiel exceeding the approved acquisition objective and not being retained as economic or contingency retention stock, and has been identified as excess materiel for possible disposal but has potential for reutilization. Potential reutilization stock is also referred to as on-hand excess inventory.

^cContingency retention stock is materiel that is retained to support specific contingencies, such as to support foreign military sales, future military operations, and disaster relief or civil emergencies, or to mitigate risk associated with diminishing manufacturing sources or nonprocureable stock.

^dEconomic retention stock is materiel that has been deemed more economical to keep than to discard because it is likely to be needed in the future.

^eApproved acquisition objective includes materiel needed to meet the requirements objective, 2 years of estimated future demand, war-reserve materiel held for the services, and materiel held because it comes from a diminishing manufacturing source.

Figure 11: Defense Logistics Agency's (DLA) Maritime Supply Chain On-Hand Inventory, End of Fiscal Years 2009-2013



Source: GAO analysis of DLA data. | GAO-14-495

^aEnd of the fiscal year 2009 inventory data were not available, so we used November 2009 data.

^bPotential reutilization stock is materiel exceeding the approved acquisition objective and not being retained as economic or contingency retention stock, and has been identified as excess materiel for possible disposal but has potential for reutilization. Potential reutilization stock is also referred to as on-hand excess inventory.

^cContingency retention stock is materiel that is retained to support specific contingencies, such as to support foreign military sales, future military operations, and disaster relief or civil emergencies, or to mitigate risk associated with diminishing manufacturing sources or nonprocureable stock.

^dEconomic retention stock is materiel that has been deemed more economical to keep than to discard because it is likely to be needed in the future.

^eApproved acquisition objective includes materiel needed to meet the requirements objective, 2 years of estimated future demand, war-reserve materiel held for the services, and materiel held because it comes from a diminishing manufacturing source.

Appendix VII: Value of the Defense Logistics Agency's On-Order and On-Order Excess Inventory

The Defense Logistics Agency (DLA) tracks the amount of on-order and on-order excess inventory on a monthly basis and reports its amount of on-order excess twice a year to the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration. Specifically, DLA tracks and reports the value of its on-order inventory, which are items that are not in DLA's possession but for which a contract has been awarded or funds have been obligated. DLA also tracks and reports the value of its 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 arrival as economic retention stock, contingency contention stock, or potential reutilization stock. On-order excess inventory that is not able to be modified or cancelled and is taken into DLA's 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. See table 7 for DLA's value of on-order and on-order excess inventory for fiscal years 2011-2013.

Table 7: The Defense Logistics Agency's (DLA) Value of On-Order and On-Order Excess Inventory, Fiscal Years 2011-2013

Millions of nominal dollars

Supply chain	Fiscal Year 2011 ^a			Fiscal Year 2012 ^a			Fiscal Year 2013 ^a		
	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
Aviation supply chain	\$2,157.9	\$216.6	10.0%	\$2,228.5	\$200.1	9.0%	\$2,120.2	\$136.8	6.5%
Land supply chain	443.2	18.7	4.2	447.1	17.3	3.9	364.7	19.1	5.2
Maritime supply chain	511.4	23.5	4.6	509.0	18.6	3.7	479.7	20.7	4.3
Total DLA^b	4,131.2	278.3	6.7	4,603.1	288.0	6.3	4,237.0	236.7	5.6

Source: GAO analysis of DLA data.

Notes: DLA tracks 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 arrival as economic retention stock, contingency retention stock, or potential reutilization stock.

^aThe value of inventory is based on DLA's inventory data at the end of the fiscal year.

^bThe total value for DLA includes all of its supply chains.

Appendix VIII: Additional Defense Logistics Agency Efforts to Improve Inventory Management

The Defense Logistics Agency (DLA) has implemented a number of efforts aimed at reducing excess inventory and backorders. These efforts are in the early stages of implementation, and more time is needed to determine their effect. These efforts are focused on (1) implementing new methods to determine inventory levels for items with low or highly variable demand, (2) improving acquisition lead time accuracy and reducing acquisition lead times, and (3) improving the efficiency of supply, storage, and distribution processes.

DLA Has Implemented New Methods to Determine Inventory Levels for Items with Low or Highly Variable Demand, but More Time Is Needed to Determine Their Effect

In January 2013, DLA instituted two new processes that set inventory levels for over 495,000 items with low or highly variable demand instead of using traditional forecasting methods that were ineffective for these items. DLA evaluates the performance of these items on a regular basis through reviewing a host of metrics—such as materiel availability, purchase request workload, and on-hand inventory levels—but it is too early to tell whether these processes are reducing administrative workload, improving availability of parts, and reducing costs, because sufficient data are not yet available.

The difficulty of forecasting demand for items has been a recurring problem within inventory management. Previous GAO reports have cited difficulty with demand forecasting at each of the services and DLA.¹ In addition, we have identified the Department of Defense (DOD) supply-chain management as a high-risk area since 1990 due in part to weaknesses in accurately forecasting the demand for spare parts.² Furthermore, DOD's *Comprehensive Inventory Management Improvement Plan* is focused, in part, on the improvement of forecast

¹See 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); *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); and *Defense Inventory: Opportunities Exist to Save Billions by Reducing Air Force's Unneeded Spare Parts Inventory*, [GAO-07-232](#) (Washington, D.C.: Apr. 27, 2007).

²See 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).

accuracy, specifically improving level-setting for low-demand items.³ Finally, the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration commissioned a study on forecasting across the department that recommended that DLA and the services should tailor their approach based on an item's demand pattern.⁴ For example, items with regular demand patterns would require traditional forecasting methodologies that rely on historical demand, whereas items with low or highly variable demand would require alternative item-management approaches, such as level-setting. For more information on DLA's approaches for planning amounts of needed inventory, see appendix IX.

These level-setting methodologies, referred to as Peak and Next-Gen, do not attempt to generate a forecast for the item based on past demand; rather they employ a statistical model that uses 5 years of historical data and assesses the risk of backorders based on factors such as the cost of the item and time between demands. The Peak and Next-Gen methodologies have been applied to about a third of DLA's active inventory items, which were selected based on their demand history characteristics.⁵ Items with infrequent demand are handled by the Peak methodology, while items with a high degree of demand variability are handled by the Next-Gen method. These models then generate quarterly minimum and maximum inventory levels for the items, instead of generating a new forecast each month through the traditional forecasting approach. The minimum and maximum levels set by Peak and Next-Gen are not intended to maximize the performance of each individual item; instead, the goal is to maximize the performance of certain key inventory metrics—such as materiel availability, purchase request workload, and on-hand inventory levels—over entire groups of items.⁶ As a result, the

³See app. I for a brief overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

⁴Accenture, *Sustainment Lifecycle Phase Forecasting and the Impact on Business Outcomes* (July 2013).

⁵Examples of the characteristics examined include the number of quarters with no demand over the last 5 years and the coefficient of variation between quarters of demand. DLA uses the coefficient of variation to describe the amount of variation seen in an item's demand history. A low coefficient of variation implies relatively steady demand, while a high coefficient implies a more variable demand.

⁶These groups of items are segmented by supply chain and by dollar amount.

process may set the maximum level of any given item to zero, based on the optimization calculation for the group of items to which it belongs.

Currently, a number of items are excluded from the Peak and Next-Gen methods. First, items with less than 2 years of demand history are excluded because the calculations for Peak and Next-Gen require at least a 2-year history. Second, items that would have slowed implementation due to complexity, such as items stocked at multiple locations, retail sites,⁷ or overseas distribution centers were not included. Third, items that were already being managed under special efforts, such as some nuclear and aviation engine items or items using a collaborative forecasting approach, were excluded from Peak and Next-Gen. DLA officials noted that Peak and Next-Gen are designed for items for which there is very little information beyond the demand history; items with additional information—such as those under active collaboration—may perform better under those different methods.

Modeling performed by the DLA Office of Operations Research and Resource Analysis (DORRA)⁸ prior to the adoption of Peak and Next-Gen suggests that the Peak and Next-Gen methodologies have the potential to improve a number of performance metrics, while significantly reducing the administrative workload associated with ordering these items. In 2011, DORRA conducted an analysis on a number of different level-setting models, including those that had been developed by DLA and contractors. Using a simulated environment of 41,000 items run over a hypothetical 3-year scenario, DORRA reported it found that the Peak and Next-Gen methods, coupled with the standard DLA forecasting method for more traditionally forecastable items, produced the best outcomes. This combination of methods in the simulation led to a substantial decrease in administrative workload, while reducing the amount of inventory and obligation authority required, and keeping materiel availability relatively unchanged. This analysis suggested that Peak and Next-Gen had the potential to improve upon a number of inventory metrics. When finalizing its decision on its approach forward, DLA determined through a second study conducted in 2012 that a mixture of

⁷Retail sites are sites that provide support to a service maintenance facility, such as an Air Force Air Logistics Complex or an Army industrial depot.

⁸DORRA is a DLA organization that performs research and analysis to inform decision- and policy- making.

the Peak, Next-Gen, and traditional DLA forecasting methods produced the best outcomes for maximizing customer service goals, while also reducing inventory levels.

At this time, Peak and Next-Gen require DLA to provide inventory data to a contractor, which performs the computer calculations necessary to arrive at the item levels, which are then passed back to DLA. DLA is still investigating the best way to bring this model into its enterprise resource-planning system, but officials from the DLA headquarters element focused on information technology and systems suggest that it could take 2 or 3 years to develop a Peak- and Next-Gen-type capability that resides within DLA's system and does not require the exporting and importing of data.

DLA currently evaluates Peak and Next-Gen using numerous metrics, such as materiel availability, purchase request workload, and on-hand inventory levels. In the first few months of implementation, DLA experienced an increase in the amount of approved acquisition objective stock for these items, but this has since leveled off. In addition, as of January 2014, officials at DLA felt that the metrics do not show any negative effects from using the Peak and Next-Gen methodologies. However, given the nature of demand for Peak and Next-Gen items—many can have several quarters of low or no demand—it will take some time before DLA can determine whether Peak and Next-Gen are having their intended effect. DLA officials told us that they do not expect to fully evaluate the effect of Peak and Next-Gen until January 2015, when 2 years of data are available. Additionally, given that there are a number of other concurrent inventory-management efforts—such as “Time to Award” and the on-hand inventory-reduction effort—it may be difficult for DLA to fully assess whether improved or degraded metrics are the result of any single policy or procedure change.

DLA Is in the Process of Implementing Efforts to Improve Acquisition Lead Time Accuracy and Reduce Acquisition Lead Times

Within the last 2 years, DLA has initiated a number of efforts that are aimed at either ensuring recorded acquisition lead times are accurate or reducing lead times, though it is too early to determine the results of these efforts. In addition, it can be difficult to separate out the effect of a given inventory effort when it is taking place at the same time as a number of other inventory efforts. DLA has worked to correct its acquisition lead times on file, reduce the amount of time it takes to award contracts, and place more items onto long-term contracts. 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

DLA Is Correcting File
Acquisition Lead Times
to Improve Its Acquisition
Lead Time Variance

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. DOD's *Comprehensive Inventory Management Improvement Plan* is focused, in part, on reducing the variance between actual acquisition lead times and recorded acquisition lead times, the latter of which are used for planning purposes in procuring items.⁹ In addition, DLA guidance has identified reducing backorders as a key agency goal. Previous GAO and third-party reports¹⁰ have noted that incorrect and long acquisition lead times can create backorders or on-hand excess inventory.¹¹

In February 2014, DLA revised the acquisition lead times—either administrative or production—of over 327,000 of the items that are recorded in its enterprise resource-planning system to decrease its acquisition lead time variance.¹² However, officials do not expect to fully see the effect of this change until about January 2015, after a few acquisition lead times have passed. Officials said that this change was done, in part, because of recent internal reviews that identified problems with the variance between the recorded acquisition lead times in the system and actual acquisition lead times.¹³ DLA has data on its acquisition lead time variance going back to fiscal year 2008; these data

⁹See app. I for a brief overview of the *Comprehensive Inventory Management Improvement Plan* and [GAO-12-493](#) for our assessment of the implementation of the plan.

¹⁰GAO, *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).

¹¹If the acquisition lead time is understated, then supply planners will not purchase enough of an item, and there will be a risk for backorders. If the acquisition lead time is overstated, the planners may purchase more equipment than necessary, potentially leading to excess.

¹²Acquisition 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, and can be calculated for both the administrative and production lead times. For example, if an item has a recorded administrative lead time of 100 days and an observed administrative lead time of 75 days, then the lead time variance is 25 days. The Office of the Secretary of Defense goal for lead time variance is +/-30 days.

¹³The reviews were associated with actions taken as a part of the implementation of the *Comprehensive Inventory Management Improvement Plan*.

show that the acquisition lead times recorded in DLA's system were consistently at least two to three times larger than the actual observed acquisition lead times. As noted earlier, the overstating of the acquisition lead time means that DLA was at risk of purchasing too much inventory. This effort was led by headquarters DLA, with input from the supply chains. DLA officials anticipate that this onetime correction, combined with additional changes to internal business rules that determine when to update acquisition lead times of record, will improve the accuracy of the recorded acquisition lead times and allow the system to update more frequently. DLA officials have stated that their previous business rules were not always sensitive enough to correctly update the acquisition lead times on record, and that their recent revisions should help reduce DLA's acquisition lead time variance as tracked through the *Comprehensive Inventory Management Improvement Plan* monitoring effort and improve its planning parameters for deciding when to order inventory.

DLA's "Time to Award"
Initiative Is Focused on
Reducing Administrative
Lead Times

In January 2013, the DLA Director also began encouraging the supply chains to reduce their administrative lead times through an effort called "Time to Award", but officials say that this effort is still in its implementation phase and it is too early to assess its full effect. This effort set aggressive goals for each of the supply chains to reduce the administrative lead times on its awards—in some cases by as much as 65 percent. The effort is intended to decrease administrative lead times by streamlining the contract award process, in part through the elimination of unnecessary or duplicative steps. According to officials, DLA has made some progress in eliminating duplicative or unnecessary steps in its award processes, though the effort is still in its early stages. For example, DLA has made changes to its processes to allow contracting officers more flexibility for smaller orders, reduced paperwork requirements, and eliminated some additional reviews that were not considered beneficial.¹⁴ A subset of metrics are also being tracked specifically to help inform the progress of the "Time to Award" effort, such as the percentage of automated awards,¹⁵ age of purchase requests, and administrative lead

¹⁴According to DLA officials, while a number of changes were considered, certain steps of the acquisition process could not be changed due to statutory reasons, such as complying with the Federal Acquisition Regulation.

¹⁵Automated awards are those awards that do not require manual efforts on the part of DLA supply managers to award. A higher percentage of automated awards generally implies a lower administrative workload.

DLA Supply Chains Are
Working to Place More Items
on Long-Term Contracts to
Help Reduce Acquisition Lead
Times

time. These metrics are regularly presented to the Director in a “Time to Award” briefing.

DLA is currently working to place more items onto long-term contracts, because officials say that these long-term contracts, which typically last between 3 and 5 years, often allow DLA to reduce administrative lead times, frequently to 15 days or less. While the use of long-term contracts has been tracked for many years at DLA, the analytical efforts described by officials at the aviation, land, and maritime supply chains to assess and pursue long-term contract candidate items based on their supply-chain effect are relatively recent and it is too early to assess the full effect. Officials said that the supply chains must constantly reassess whether a given contract makes sense based on current operations and demands from the services. In addition, officials at the DLA supply chains stated that they have recently taken steps to ensure that the items being placed onto long-term contracts are their business drivers—items that see a lot of sales volume, that account for a large percentage of spending, or that have an outsized influence on metrics such as materiel availability. DLA currently develops annual supply chain–specific goals for the percentage of obligations made through long-term contracts.¹⁶ The fiscal year 2014 goal for the land and maritime supply chains is 49 percent of all obligations, while the aviation supply-chain goal is for 60 percent of all obligations to be made through a long-term contract. Officials at the land and maritime supply chains told us that they have recently begun to focus their long-term contract efforts on their big business drivers and report that roughly 80 percent of these drivers will be placed on long-term contract award within the next year. Similarly, the aviation supply chain has identified roughly 10 percent of its recently active inventory¹⁷ as being the primary drivers of customer demands, inventory dollars spent, and items affecting their materiel availability metric. According to aviation supply-chain officials, their strategies to increase their use of long-term contracts have focused on these particular items. In addition to focusing on their business drivers, officials from the supply chains told us that they

¹⁶Despite the potential advantages of long-term contracts, officials told us that they do not expect the supply chains to place all their items onto long-term contracts because such contracts do not always make financial sense, either for DLA or for the business making the item.

¹⁷“Recently active” in this case means items that have seen a demand in the last 2 years.

also conduct cost-benefit analyses of large long-term contracts to ensure that DLA will benefit from them.

Efforts to Improve Efficiency of DOD's Supply, Storage, and Distribution Processes Are Underway, but Are in the Early Stages and Face Challenges

DOD's strategic network optimization program is intended to improve the efficiency of its supply, storage, and distribution processes across the globe while maintaining or enhancing responsiveness to the customer; however, the department has not fully implemented its efforts and its savings estimates are preliminary. The program, which is overseen by the Assistant Secretary of Defense for Logistics and Materiel Readiness and is being managed by DLA, has three phases. Phase 1 focuses on minimizing costs through effective stock positioning, phase 2 on reducing on-hand inventory levels, and phase 3 on eliminating unneeded infrastructure.

In phase 1, underway currently, DLA has begun revising its methodology for determining the optimal locations (i.e., distribution depots) to stock specific items in order to minimize transportation costs while maintaining responsiveness to the customer. DLA began implementing its new stock-positioning methodology in 2012 and plans to complete implementation by the end of fiscal year 2014. DLA is projecting it will achieve \$402 million in net savings through reduction in transportation and inventory costs and has officially removed \$231 million from its working capital fund obligation authority across fiscal years 2014 to 2019. According to DLA officials, the remainder of the savings—\$171 million—is expected to be “given back” to the services through reductions in transportation rates.¹⁸ However, these savings have not been finalized in a working capital fund budget.

For phase 2, DOD aims to reduce the aggregate levels of its inventory by DLA achieving total visibility of consumable items and their associated inventories across DOD.¹⁹ DLA and the services have developed a business plan to guide implementation, which will occur during fiscal year 2015. Officials said that the basic concept of this phase involves

¹⁸According to DLA officials, phase 1 will result in less materiel needing to be moved across the distribution network, which will result in reduced transportation costs for DLA. According to the DLA officials, these reduced transportation costs will result in lower rates charged to its customers—the military services.

¹⁹Consumable items are normally expended or intended to be used up beyond recovery.

enhancing the current in-storage visibility program, which provides limited visibility into DLA-managed consumable inventory across the department, regardless of location and ownership.²⁰ DLA's current in-storage visibility program tracks the value of inventory that DLA was able to (1) redistribute from one military service to fill an order from another military service and (2) procure from a military service to reduce or replace a planned purchase of inventory. For example, the department redistributed \$34.5 million in inventory and was able to avoid the procurement of an additional \$44.7 million in inventory during fiscal year 2013 through the program. See table 8 for the value of inventory redistributed and procured by DLA from a military service to reduce or replace a planned purchase of inventory since fiscal year 2011.

Table 8: Value of Inventory DLA Redistributed and Procured to Reduce or Replace a Planned Purchase since Fiscal Year 2011

Nominal dollars

Year	Amount redistributed	Value of procurement avoided	Total by year
2011	\$54,809,311	\$13,494,340	\$68,303,651
2012	41,947,694	11,735,937	53,683,631
2013	34,453,282	44,661,259	79,114,541

Source: GAO analysis of DOD data.

According to department officials, the current in-storage visibility program does not provide DLA the visibility into retail stocks it needs to efficiently and effectively plan its supply support activities. Specifically, DLA has limited visibility of DLA-managed inventory the services hold at the retail level. Consequently, it can have difficulty efficiently and effectively planning the procurement of needed items to meet retail demand. Additionally, officials said that DLA is dependent upon the services' retail locations to respond to DLA requests to obtain its excess stock for redistribution or the reduction of planned procurement. Furthermore, sites participating in the current in-storage visibility program have primarily

²⁰Some of this DLA-managed inventory is held and owned by DLA, and some by the services.

been limited to the Army and Air Force.²¹ Through enhancements to the current in-storage visibility program, the department is striving to improve DLA's visibility into retail level demands, fill orders using service-owned retail stocks, and jointly set wholesale and retail inventory levels to achieve required performance with minimal inventory.²²

DLA and Office of the Deputy Assistant Secretary of the Defense for Supply Chain Integration officials believe the phase 2 efforts, if accomplished, could enhance the efficiency and effectiveness of DOD's inventory-management practices, but the department recognizes that it confronts two major challenges in achieving its stated objectives. First, the department is faced with establishing business rules—such as policies and processes for improving visibility and accessibility to the military services' retail level inventory—to govern the department's planned enhancements, which will require considerable coordination and collaboration among the military services and DLA. Second, the department is challenged to ensure that it has the information-technology capabilities in place to adequately automate the processes. DLA is focused on addressing these challenges in its implementation of phase 2.

For phase 2, DLA tentatively estimates savings of about \$860 million, spread across fiscal years 2015 to 2019, but DLA officials have told us that the current projected savings are not directly attributable to the planned strategic network optimization phase 2 efforts, such as enhanced in-storage visibility. Specifically, DLA officials told us that the methodology used to determine these preliminary savings relies on DLA's ongoing inventory-reduction effort, rather than on any efforts attributable to the strategic network optimization program. Further, DLA officials stated that these savings are likely very optimistic. Currently, DLA is reviewing and validating the savings through its regular budgeting processes and changes may occur based on this review.

²¹Officials said that the Navy's participation has been limited due to implementation challenges associated with its Enterprise Resource Planning System and the Marine Corps has not yet started to participate, but is interested in participating.

²²The wholesale level is the highest level of organized supply and, as such, procures, repairs, and maintains stocks to resupply the retail levels of supply. The retail level of inventory is at the consumer level (directly supporting customers) or at the intermediate level (supporting a geographical area).

Phase 3, predicated on the reduction of inventory in Phase 2, intends to reduce DOD's infrastructure footprint by eliminating warehouses, thus reducing storage and building sustainment costs. The strategic network optimization program plans to begin implementing this phase in fiscal year 2016 and currently is projecting \$175 million in savings spread across fiscal years 2015 to 2019. However, the details of such an infrastructure reduction remain unclear at this point and the savings estimates are not finalized.



Background—Demand and Supply Planning

DLA has two main facets of inventory planning: demand planning and supply planning. Demand planners gather data (e.g., requirements from a military depot), determine how the demand plan will be created, generate the plan, and provide the plan to others in the organization. The process used to determine the amount needed varies based on the characteristics of the specific items. For example, statistical forecasting based on historical demand is used for items that have regular and frequent demand while other methods, such as level-setting, are used for items that have low or highly variable demand. In contrast, supply planners use the demand plan to determine how best to procure the items. Within DLA, the demand and supply planning functions also require input from weapon-systems managers, customer-account specialists, and procurement officials.

Key Definitions

Coefficient of variation: As defined by DLA, the amount of variation seen in an item’s demand history. A low coefficient of variation (below one) means relatively steady demand, while a high coefficient (above one) means a more variable demand.

Demand data exchange: A customer-collaboration program intended to improve demand forecasting accuracy and the timely availability of spare parts to the military services.

Appendix IX: Defense Logistics Agency’s Approaches for Planning Amounts of Inventory

The Defense Logistics Agency (DLA) manages approximately 4.6 million consumable items. However, DLA does not stock about 3.1 million of the items. DLA generally supports these items through a direct vendor delivery approach or DLA procures items when they are requested by a customer. DLA supports its remaining 1.5 million items through stocking inventory so it is available to customers upon request. DLA uses a number of business rules, such as the number of demands over a period of time, to determine what items are not stocked and what items are stocked.

DLA uses a number of approaches to determine the appropriate amount of inventory to have on-hand for its stocked items. See table 9 for the approaches used by DLA. In some cases, DLA may use multiple approaches for an item to determine the amount of inventory needed across the enterprise. For example, some demand for an item may be forecasted through its demand planning system while another portion is determined through collaboration. Additionally, the amount of inventory needed varies over time. Therefore, DLA is constantly adjusting, based on new, emerging or declining requirements, to make sure that inventory on-hand is sufficient to meet customers’ needs, while trying not to accumulate excess inventory.

Table 9: DLA’s Approaches to Determining the Amount of Inventory

Approach	Key criteria for using approach for an item	Description	Approximate number of items ^a
Demand planning system	Demand in greater than 50 percent of quarters over the last 5 years, with a coefficient of variation between those quarters of less than or equal to 1.	Simple and advanced forecast modeling, based on historical demand, determines the amount of inventory needed over time.	200,000
Next-Gen	Demand in more than 50 percent of quarters over the last 5 years, with a coefficient of variation between those quarters greater than 1.	Optimization model evaluates several metrics to determine the minimum and maximum level of inventory for items.	137,000
Peak	Demand in less than 50 percent of quarters over the last 5 years.	Computation establishes a minimum and maximum level of inventory for the item.	334,000
Stock Keeping Unit (SKU) Build	Item must have at least two demands in at least 1 month over the last 12 months in order to be stocked at the location. These items do not meet the criteria to use the demand planning system and are not suited for Peak methodology due to multiple location management.	Computation establishes the amount of inventory stocked at each location over time based on the activity at that particular location.	834,000
Collaboration	Items with a collaboration agreement with the customer, such as demand data exchange.	Customer input, rather than historical demand, determines the amount needed over time.	38,000

Source: GAO analysis of Defense Logistics Agency (DLA) information.

^aItem numbers are as of March 2014 and can fluctuate over time.

Appendix X: Print-Friendly Version of Figure 8—Overview of the Defense Logistics Agency’s (DLA) Regular Performance-Management Meetings

Meeting name	Level of meeting	Description
Executive Board ^a	DLA Director	The Executive Board meets quarterly and reviews the supply-chain Agency Performance Review metrics, which are the key performance metrics for DLA. It reviews a number of metrics that describe different areas of inventory management, such as customer service, cost, and internal efficiency.
Inventory Management Council	DLA Director	This meeting focuses on strategic-level initiatives that have the Director’s interest. The metrics reviewed here will vary from month to month according to the specific initiatives being discussed. Many of the recent Inventory Management Council meetings have focused on the inventory reduction effort.
J-3 Agency Performance Review ^a	DLA Headquarters	In months where the Executive Board does not meet, the Agency Performance Review metrics are still reviewed at the J-3 level. A summary of this meeting and the metrics discussed is still provided to the Director.
J-3 Backorder, Purchase Request, and Inventory Reviews	DLA Headquarters	These reviews are focused on three areas: backorders, purchase requests, and inventory levels. Each supply chain will speak once per quarter about certain aged backorders and purchase requests, and describe what’s being done to resolve those specific orders. They will also discuss any problems that arise from disposing of certain inventory items as part of the inventory-reduction effort.
J-7 Review and Analysis	DLA Headquarters	This meeting is focused on a number of procurement-related metrics such as the number of purchase requests, the use of long-term contracts, and the timeliness of awards.
J-8 Business Assessment	DLA Headquarters	This assessment is focused on the days of cash that DLA has on hand to support the working capital fund as well as the net operating result of the supply chains and other DLA organizations.
Aviation Corporate Board ^a	DLA Supply Chain	This meeting is focused on many of the same metrics reviewed at the higher-level Agency Performance Review meetings, but also includes a number of metrics used just by the supply chain such as potential backorders, administrative and production lead times, and on-order excess.
Land and Maritime Agency Performance Review ^a	DLA Supply Chain	The land and maritime supply chains hold a mid-month update on the Agency Performance Review metrics with their commander.
Land and Maritime Monthly Business Review	DLA Supply Chain	This meeting rotates between looking at DLA’s land and maritime distribution detachments.

Source: GAO analysis of DOD guidance and inventory practices.

^aThese meetings focus on the Agency Performance Review metrics.

Appendix XI: Comments from the Department of Defense



LOGISTICS AND
MATERIEL READINESS

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

JUN 13 2014

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 Government Accountability Office (GAO) Draft Report, GAO-14-495, "Defense Inventory: Actions Needed to Improve Defense Logistics Agency's Inventory Management," dated May 8, 2014 (GAO Code 351820). Detailed comments on the report recommendations are enclosed.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul D. Peters".

Paul D. Peters
Acting

Enclosure:
As stated

GAO DRAFT REPORT DATED MAY 8, 2014
GAO-14-495 (GAO CODE 351820)

“DEFENSE INVENTORY: ACTIONS NEEDED TO IMPROVE DEFENSE LOGISTICS
AGENCY'S INVENTORY MANAGEMENT”

DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATION

RECOMMENDATION 1: The GAO recommends that the Secretary of Defense direct the Director, Defense Logistics Agency, to reassess and, if determined appropriate, revise DLA's inventory reduction goals and schedule for achieving them to minimize risks and costs of having to re-buy items in the long-term.

DoD RESPONSE: Concur. DLA reviews its inventory goals monthly via Inventory Management Council (IMC) meetings. Declining demand, recent and pending Logistics Reassignments, retail capitalization, and the probability of future demand for Economic Retention Stock are assessed. As is noted by GAO, DLA changed its inventory reduction goal from \$8.2B to \$10B and anticipates additional changes to be made at future IMC meetings based on the Supply Chain Commander input and subsequent decision made by the DLA Director.

RECOMMENDATION 2: The GAO recommends that the Secretary of Defense direct the Director, Defense Logistics Agency, to regularly monitor progress reducing on-order excess inventory through DLA's senior management performance briefings.

DoD RESPONSE: Concur. DLA will include a comprehensive on-order excess discussion at the IMC meeting on a quarterly basis.

RECOMMENDATION 3: The GAO recommends that the Secretary of Defense direct the Director, Defense Logistics Agency, to track and regularly review performance data, such as the amount of on-order excess inventory reviewed, modified or cancelled, and the reasons for not modifying or cancelling, on its on-order excess inventory management processes through its newly established automated report.

DoD RESPONSE: Concur. DLA will include a comprehensive on-order excess discussion at the IMC meeting on a quarterly basis.

RECOMMENDATION 4: The GAO recommends that the Secretary of Defense direct the Director, Defense Logistics Agency, to establish supply chain specific on-order excess goals that support DLA minimizing its investment in inventory that is not needed to meet requirements and achieving the DoD goal of 4 percent by the end of fiscal year 2016.

DoD RESPONSE: Concur. DLA will establish Supply Chain specific on-order excess goals by August 2014.

RECOMMENDATION 5: The GAO recommends that the Secretary of Defense direct the Director, Defense Logistics Agency, to monitor on a regular basis DLA's progress toward achieving the supply chain specific goals.

DoD RESPONSE: Concur. After supply chain specific goals are established by August 2014, DLA will monitor progress toward achieving those goals during on-order excess discussions at the IMC meeting on a quarterly basis.

RECOMMENDATION 6: The GAO recommends that the Secretary of Defense direct the Director, Defense Logistics Agency, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Secretaries of the Army, Navy, and Air Force, to develop metrics, in addition to currently developed demand forecast accuracy and error metrics, that allow DLA and the services to evaluate whether the program is improving supply chain management performance and providing an adequate return on its investments.

DoD RESPONSE: Concur. DLA, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Military Services, will evaluate the effectiveness of current forecasting performance metrics, modify current logic as needed and develop additional metrics, as appropriate.

RECOMMENDATION 7: The GAO recommends that the Secretary of Defense direct the Director, Defense Logistics Agency, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Secretaries of the Army, Navy, and Air Force, to use the metrics to monitor the performance of collaborative forecasting across DOD through a results-oriented management approach, such as regular performance management meetings.

DoD RESPONSE: Concur. DLA, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Military Services, will compare collaborative forecasting against conventional statistical forecasting and other level setting techniques, and use the results to monitor performance across the DoD at regular performance management meetings.

RECOMMENDATION 8: The GAO recommends that the Secretary of Defense direct the Director, Defense Logistics Agency, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Secretaries of the Army, Navy, and Air Force, to develop and implement the necessary corrective actions to improve the results of collaborative forecasting across DOD.

DoD RESPONSE: Concur. DLA, in collaboration with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Secretaries of the Army, Navy, and Air Force, is developing feedback mechanisms and performance trending analysis to improve DLA collaborative forecasting activities. Development of corrective actions will be complete by November 2014. Implementation of corrective actions will follow in coordination with the Military Services.

Appendix XII: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the individual named above, key contributors to this report were Suzanne Wren (Assistant Director); John Bumgarner; Richard Burkard; Elizabeth Curda; Dave Hubbell; James Lackey; Carol Petersen; Steve Pruitt; Greg Pignetti; Terry Richardson; Amie Steele; Michael Willems; and Erik Wilkins-McKee.

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