

GAO

Report to the Chairman,
Subcommittee on Defense,
Committee on Appropriations,
House of Representatives

August 2003

DEFENSE INVENTORY

Opportunities Exist to Improve Spare Parts Support Aboard Deployed Navy Ships



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Highlights of [GAO-03-887](#), a report to the Chairman, Subcommittee on Defense, Committee on Appropriations, House of Representatives

Why GAO Did This Study

GAO is conducting a series of reviews in response to a congressional request to identify ways to improve the Department of Defense's (DOD's) availability of high-quality spare parts for ships, aircraft, vehicles, and weapons systems. This report focuses on the effectiveness of the U.S. Navy's spare parts support to deployed ships. It examines (1) the extent to which the Navy is meeting its spare parts supply goals, (2) the reasons for any unmet supply goals, and (3) the effects of spare parts supply problems on ship operations, mission readiness, and costs.

To conduct the review, GAO looked at data on parts requisitions, maintenance work orders, and casualty reports for various Navy ship deployments between fiscal years 1999 and 2003.

What GAO Recommends

GAO is recommending that the Navy (1) develop plans to conduct periodic ship configuration audits and ensure that configuration records are updated and maintained, (2) ensure that parts demand data are entered into ship supply systems promptly and accurately as required, (3) periodically purge unneeded spare parts from ship stocks to reduce costs, and (4) ensure casualty reports are issued consistent high-priority maintenance work orders as required. DOD concurred with the first three recommendations and the intent of the fourth recommendation.

www.gao.gov/cgi-bin/getrpt?GAO-03-887.

To view the full product, including the scope and methodology, click on the link above. For more information, contact William M. Solis at (202) 512-8412 or solisw@gao.gov.

DEFENSE INVENTORY

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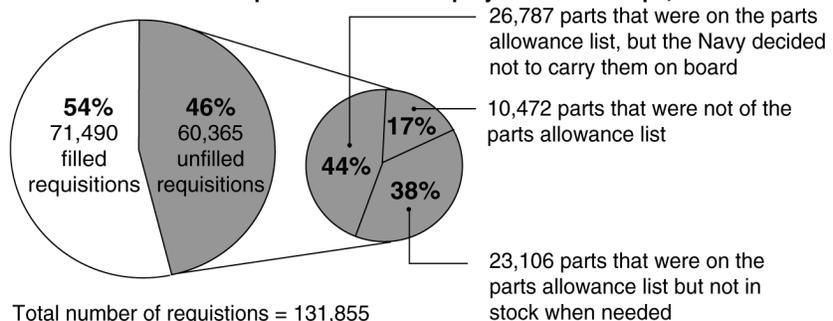
What GAO Found

In typical 6-month deployments at sea, Navy ships are generally unable to meet the Navy's supply performance goals for spare parts. GAO's analysis of data for 132,000 parts requisitions from ships in 6 Atlantic and Pacific battle groups deployed in fiscal years 1999 and 2000 showed that 54 percent could be filled from inventories onboard ship. This supply rate falls short of Navy's long-standing 65 percent goal. When parts were requisitioned, maintenance crews waited an average of 18.1 days to get the parts—more than 3 times the Navy's wait-time goal of 5.6 days for ships outside the continental United States. The Navy recognizes it has not met its supply goals for over 20 years.

Two key problems contribute to the Navy's inability to achieve its supply goals. Its ship configuration records, which identify the types of equipment and weapons systems that are installed on a ship, are often inaccurate because they are not updated in a timely manner and because audits to ensure their accuracy are not conducted periodically. In addition, the Navy's historical demand data are often out-of-date, incomplete, or erroneous because supply crews do not always enter the right information into the ships' supply system databases or do not enter it on a timely basis. Because configuration-record and demand data are used in models to estimate what a ship needs to carry in inventory, inaccuracies in this information can result in a ship's not stocking the right parts for the equipment on board or not carrying the right number of parts that may be needed during deployment. The Navy's reasons for unfilled requisitions are shown in the figure below.

While precise impacts are not always well defined, the Navy's spare parts supply problems can affect a deployed ship's operations, mission readiness, and costs. GAO's analysis of data on 50,000 work orders from 6 deployed battle groups showed that 58 percent could not be completed because the right parts were not available onboard. More complete reporting of work orders identified as critical or important would have resulted in a more complete assessment of ship mission readiness. In addition, the Navy expends substantial funds—nearly \$25 million for six ships GAO reviewed—to maintain large inventories that are not requisitioned during deployments.

Reasons for Unfilled Requisitions for Six Deployed Battle Groups, Fiscal Year 1999-2000



Total number of requisitions = 131,855

Source: GAO analysis of Navy data.

Note: Because of rounding, percentages may not add to 100.

Contents

Letter		1
	Results in Brief	2
	Background	4
	Deployed Ships' Supply Goals Go Unmet As Only About Half of Needed Spare Parts Are Onboard	6
	Inaccurate Configuration and Demand Data Contribute to Unmet Supply Goals	9
	Spare Parts Supply Problems Can Affect Ship Operations and Mission Readiness and Increase Costs	13
	Conclusions	19
	Recommendations for Executive Action	20
	Agency Comments and Our Evaluation	20

Appendix I	Scope and Methodology	23
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Appendix II	Navy Work Order Priority Code Descriptions	25
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Appendix III	Navy Reasons for Spare Parts Not Onboard Deployed Ships	27
---------------------	--	-----------

Appendix IV	Comments from the Department of Defense	28
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Tables		
	Table 1: Navy Spare Parts Supply Rates for Six Selected Deployed Battle Groups, Fiscal Years 1999-2000	7
	Table 2: Navy Spare Parts Average Wait-Times, in Days, for Six Selected Deployed Battle Groups, Fiscal Years 1999-2000	8
	Table 3: Percentages of Parts Types and Quantities Allowed to Be Stocked Onboard and the Parts Supply Effectiveness Rates for Lincoln Battle Group Surface Ships during the First 90 Days of Deployment, July-September 2002	13
	Table 4: Impact of Spare Parts Shortages on Completion of Maintenance Jobs for Selected Fiscal Years 1999 to 2000 Deployments	14

Table 5: Number of Different Types of Parts Carried Compared with Total and Filled Requisitions for Lincoln Battle Group Surface Ships after 6 Months of Deployment, July-December 2002	17
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Figures

Figure 1: Estimated Value of the Spare Parts Inventory Carried Onboard and Actually Used during First 6 Months of Deployment on Lincoln Battle Group Surface Ships, Fiscal Year 2002	18
Figure 2: Spare Parts Requisitions Filled and Unfilled for Six Selected Battle Groups, Fiscal Years 1999-2000, According to Reasons Identified by the Navy	27

Abbreviations

3-M	Maintenance and Material Management
CASREP	Casualty Report
COSAL	Coordinated Shipboard Allowance List
DOD	Department of Defense
SORTS	Status of Resources and Training System

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Accountability * Integrity * Reliability

United States General Accounting Office
Washington, DC 20548

August 29, 2003

The Honorable Jerry Lewis
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

During deployments of U.S. Navy ships around the world, it is inevitable that some of the equipment or weapons systems on board these ships will break down and need repairs. To meet this eventuality, the Navy stocks each ship with tens of thousands of spare parts to enable the ship's crew to maintain and repair the equipment in a timely manner. If the needed spare parts are not on board the ship, the repair work could be delayed—and equipment disabled—while supply crews obtain the parts from off-ship sources.¹ During this delay, the ship's operations and mission readiness may be compromised.

This report is one of a series of reviews that we are conducting in response to your request that we identify ways to improve the Department of Defense's (DOD's) availability of high quality spare parts for aircraft, ships, vehicles, and weapons systems. In one of these reviews, we found that the Navy's servicewide strategic plan does not specifically address means to mitigate critical spare parts shortages.² This report focuses on the effectiveness of spare parts support provided to deployed U.S. Navy ships. To address this issue, we examined (1) the extent to which the Navy is meeting its spare parts supply goals on deployed ships, (2) the reasons for any unmet supply goals, and (3) the effects of spare parts supply problems on ships' operations, mission readiness, and costs.

¹ Off-ship sources include shore-based suppliers, such as Navy and Defense Logistics Agency warehouses and commercial vendors, and other ships in the fleet where needed spare parts may be obtained.

² U.S. General Accounting Office, *Defense Inventory: Navy Logistics Strategy and Initiatives Need to Address Spare Parts Shortages*, [GAO-03-708](#) (Washington, D.C.: June 27, 2003).

In performing our work, we examined a variety of data related to Navy spare parts supply and ship maintenance. These data covered different time periods between 1999 and 2003 and represented the most current or accessible information available during the period of our analysis. As part of our study, we analyzed spare parts requisitions from Navy ships deployed in Atlantic and Pacific fleet battle groups,³ amphibious readiness groups, and Marine Corps expeditionary forces for varying periods during fiscal years 1999 to 2001. We also analyzed maintenance work order and casualty report data from the 6-month deployments of the Truman battle group (Atlantic Fleet) in fiscal year 2000, and spare parts carried and used by the Lincoln battle group (Pacific Fleet) in fiscal year 2002. In addition, we reviewed historical information from 1982 to 2000 on the Navy's ability to fill onboard spare parts requests for both deployed and nondeployed ships. We conducted our review from July 2002 to May 2003 in accordance with generally accepted government auditing standards. Further details on the scope and methodology we used in our work are found in appendix I.

Results in Brief

During typical 6-month deployments at sea, Navy ships generally have been unable to meet the goals that the Navy fleets use in assessing spare-parts supply performance. Our analysis of data for ships in 6 battle groups from the Atlantic and Pacific fleets that deployed during fiscal years 1999 and 2000 indicated that only about 54 percent of the total of 131,855 requisitions could be filled from onboard ship stocks and that the remainder had to be requested from off-ship sources. This performance falls short of the average supply effectiveness rate⁴ of 65 percent that the Navy fleets use as a goal for filling spare parts requisitions from onboard stocks. When needed high-priority parts were requisitioned, maintenance crews had to wait an average of about 18.1 days to receive the parts—more than three times the Navy's wait-time goal of 5.6 days for ships outside the continental United States. Moreover, other Navy data suggest that these wait times can even be longer. These unmet goals are not a new problem. The Navy recognizes that its ship supply effectiveness performance has fallen short of its goals for more than 20 years.

³ Battle groups generally consist of 8 to 12 ships and include an aircraft carrier and 1 or more cruisers, destroyers, frigates, submarines, and supply ships.

⁴ Supply effectiveness rates refer to gross availability, or the percentage of parts that were in stock on the ship when requisitioned.

Our analysis identified two key problems that contribute to the Navy's inability to achieve its supply goals for deployed ships. First, the Navy's ship configuration records, which identify the kinds of equipment or weapons systems installed on a ship, are often inaccurate. These inaccuracies occur because configuration records are not always captured or updated in a timely manner when new equipment is installed aboard ship and because audits to ensure correct records are not conducted periodically. Second, the Navy's historical demand data, which reflect the failure rates of specific parts, are frequently out-of-date, incomplete, or erroneous because the right information is not always entered, or entered on a timely basis, into the supply system databases as required. Because the Navy uses configuration records and demand data in its allowance models to estimate what a ship needs to carry in its inventory during deployment, inaccuracies in this data can result in a ship's not stocking the right parts—or not carrying the right number of parts—for the equipment or systems installed on board. Thus, even though a ship may stock nearly all of the parts identified on its allowance list, it may still fall short of meeting the Navy's supply goals.

The Navy's spare parts supply problems can adversely affect a deployed ship's operations and mission readiness because necessary repairs may be delayed while equipment remains disabled, and they also can increase costs. Our analysis of data on more than 50,000 maintenance work orders opened during the deployments of 6 battle groups indicated that about 29,000, or 58 percent, could not be completed because the needed repair parts were not available on board ship. The full impact of such shortages on a ship's operations and mission readiness is not easily determined because of discrepancies in the numbers of high-priority maintenance work orders and casualty reports issued.⁵ An inspection of data for one battle group showed that, although many of the work orders were identified as high-priority because they affected equipment critical for the ship's operations and mission readiness, ship crews did not always issue the required casualty reports. Where casualty reports were issued, these problems were generally reflected in ship's readiness reporting. However, fuller casualty reporting would have likely resulted in a more complete

⁵ According to Navy guidance, each high-priority maintenance work order (with priority codes 1, 2, and 3) filled out by a ship's crew is supposed to generate a casualty report (CASREP). Casualty reports are directly related to a unit's readiness reporting; they identify a ship's equipment status and its impact on ship operations and mission readiness. Appendix II shows the relationship between these two reporting systems, according to Navy maintenance reporting guidance.

assessment of readiness. The Navy's parts supply problems can also affect costs. Although the exact amounts have not been quantified, Navy officials recognize that they incur additional costs—when needed spare parts are not available on board ship—to locate and transport the needed parts from off-ship sources. The Navy also expends substantial funds—totaling nearly \$25 million for the 6 ships we reviewed—to maintain large inventories that are not requisitioned during deployments because its efforts to periodically identify and remove unneeded spare parts from ship inventories are given low priority.

Given the critical nature of spare parts shortages and their impact on ship operations and readiness, we are recommending that the Secretary of Defense direct the Secretary of the Navy to (1) develop plans to improve ship configuration records; (2) ensure that historical demand data are recorded promptly and accurately as required, (3) periodically identify and, when appropriate, purge unnecessary spare parts from its ships' inventories to reduce costs; and (4) ensure that casualty reports are issued consistent with high priority maintenance work orders as required to determine clearly the impact of spare parts shortages on ships' operations and mission readiness. DOD concurred with the first three recommendations and concurred with the intent of the fourth recommendation. DOD's comments and our evaluation of them are on page 20 of this report.

Background

The Chief of Naval Operations is responsible to the Secretary of the Navy for the command, utilization of resources, and operating efficiency of the operational forces of the Navy and of the Navy's shore activities. The shore establishment provides support to the operating forces (known as the fleet), including facilities for the repair of machinery and electronics, ships, and aircraft, and for the storage of spare parts. The Naval Supply Systems Command provides naval forces with supplies and services through a worldwide, integrated supply system. Its Naval Inventory Control Point exercises centralized control over different line items of repair parts, components, and assemblies for ships, aircraft, and other weapons systems.

Supplying spare parts to deployed ships requires coordination between the supply command and the Naval operating forces. The operating forces report to the Chief of Naval Operations and provide, train, and equip naval forces. The operating forces also report to the appropriate Unified Combatant Commanders. As units of the Navy enter one of the designated worldwide areas of Naval responsibility, they are operationally assigned to the appropriate numbered fleet. All Navy units also have an administrative chain of command with the various ships reporting to the appropriate ship type commander: aircraft carriers, aircraft squadrons, and air stations are under the Commander, Naval Air Force; submarines come under the Commander, Submarine Force; and all other ships fall under the Commander, Naval Surface Forces. Normally, the type commander controls the ship during its primary and intermediate training cycles, and then it moves under the operational control of a fleet commander.

The Navy determines what kinds of spare parts to carry on board deployed ships by identifying the kinds of equipment that are installed (the ship's configuration) and the types and quantities of repair parts and any special tools, test equipment, or support equipment needed to do preventive and corrective maintenance during extended and unreplenished periods at sea. Specifically, the Navy identifies maintenance requirements and uses them to develop a list of allowable parts for the equipment. For parts on the list, the Navy uses predicted failure rates, which it updates using actual demand for parts data in inventory allowance models. The office of the Chief of Naval Operations approves these models.

Although the Navy revised its instruction for determining spare parts supply effectiveness in October 1999, it continues informally to use the supply-system performance goals that were established in 1983.⁶ These performance goals measure a ship's ability to fill all of the repair part requisitions that it receives. Two important goals are: (1) that gross availability of 65 percent of repair parts required by ships and aircraft carriers are to be filled from onboard inventories⁷ and (2) that the average customer wait-time for the delivery of high-priority parts from ships' supply inventories and off-ship sources is to occur within 135 hours (or about 5.6 days) for ships outside of the continental United States. This

⁶ These goals were defined in the Navy instruction OPNAVINST 4441.12B, dated May 1983, Retail Supply Support of Naval Activities and Operating Forces.

⁷ While the Navy's supply effectiveness goals vary, the goal is 65 percent for surface ships and aircraft carriers, not including the aircraft.

average customer wait-time is the supply system's response time from the date an order for a required part is issued until it is received by the customer. The Navy is in the process of revising its supply performance goals but it has not yet completed this work.⁸

The Navy's annual budgets contain about \$750 million for ships' spare parts, including about \$200 million for initial spares and about \$525 million for replenishment spares. However, the Navy also identifies requirements for spare parts that have not been funded. For example, it identified \$200 million in unfunded requirements in the fiscal years 2002 to 2004 budgets to increase safety-level stock for repairable items.

Deployed Ships' Supply Goals Go Unmet As Only About Half of Needed Spare Parts Are Onboard

Only about 54 percent of spare parts requisitions for ships in 6 battle groups in the Atlantic and Pacific fleets deployed in fiscal years 1999 and 2000 could be filled from onboard sources—a supply effectiveness rate that fell below the Navy's goal of 65 percent. When priority parts were not on board, ships had to wait an average of 18.1 days, more than 3 times the Navy's wait-time goal of 5.6 days for ships outside the continental United States. The Navy has fallen short of meeting its ship supply performance goals for more than 20 years.

Ships Average 54 Percent Onboard Parts Supply Rates

Our analysis of ships in 6 selected Atlantic and Pacific fleet battle groups deployed in fiscal years 1999 and 2000 showed that on average they were able to supply about 54 percent of the spare parts that were requisitioned from onboard inventories. As table 1 shows, this average supply effectiveness rate ranged from 51 to 61 percent for different battle groups during that period. The rates fell short of the Navy's supply system performance goal of 65 percent for surface ships and aircraft carriers, which it has used informally since 1999.

⁸ OPNAVINST 4441.12D, Apr. 29, 2003, Retail Supply Support of Naval Activities and Operating Forces.

Table 1: Navy Spare Parts Supply Rates for Six Selected Deployed Battle Groups, Fiscal Years 1999-2000

Battle group (year deployed)	Total number of requisitions	Number filled onboard	Supply rate ^a	Number not filled onboard	Percent not filled
Atlantic Fleet					
Enterprise (1999) ^b	33,346	17,123	51	16,213	49
Kennedy (1999)	35,992	19,127	53	16,865	47
Truman (2000)	22,253	12,069	54	10,184	46
Pacific Fleet					
Constellation (1999)	12,432	7,556	61	4,876	39
Stennis (2000)	16,175	9,668	60	6,507	40
Lincoln (2000)	11,657	5,937	51	5,720	49
Total/average percent	131,855	71,490	54	60,365	46

Source: GAO analysis of Navy data.

^aThe supply rate is the percentage of requisitions filled from parts available on board ships.

^bThe Enterprise battle group deployed in October 1998, the first month of fiscal year 1999.

These supply rates for the deployed battle groups are consistent with fleetwide historical data available from Navy reports. These data show that from 1982 to 2000 Navy ships in both deployed and nondeployed status were, on average, able to fill about 55 percent of their parts requisitions from onboard inventories. These rates have not varied much over the past 20 years, indicating that little overall progress has been made in meeting the Navy's 65 percent goal.

These findings were further reinforced by our analysis of Navy data for Pacific Fleet surface ships in amphibious readiness groups and ships in Marine Corps expeditionary forces. These groups, which included a total of 42 ships, showed an average availability of about 54 percent of spare parts requisitioned during deployments in calendar years 1999 to 2001, although individual ships reported a wide range of supply rates. For example, a destroyer in one Marine expeditionary force group reported an average supply rate of about 31 percent during deployment, whereas a ship used to transport and land Marines and their equipment and supplies in a deployed amphibious readiness group averaged 62 percent.

Average Wait-Times Exceed Navy Goal

When requisitioned parts were not on board ship, the Navy maintenance crew had to wait far longer than the Navy's stated wait-time goals to obtain the needed parts from off-ship sources. The wait-time goal for critical, high-priority items for ships outside the continental United States is 5.6 days.⁹ The Navy's data for these ships, which were deployed between fiscal year 2000 and February 2003, showed that when needed high-priority parts were requisitioned, maintenance crews had to wait an average of 18.1 days—more than 3 times the Navy's wait-time goal—to receive the parts.¹⁰

The average wait-times for all spare parts, not just priority items, are even longer. For the six Atlantic and Pacific battle groups deployed in fiscal years 1999 and 2000 that we analyzed, repair crews experienced an overall average wait-time of about 25.6 days, with a range of 16.2 to 32.5 days. Table 2 shows the wait-times for spare parts supplied both from off-ship sources, as well as from onboard supplies.

Table 2: Navy Spare Parts Average Wait-Times, in Days, for Six Selected Deployed Battle Groups, Fiscal Years 1999-2000

Battle group (year deployed)	On-ship average wait-time days	Off-ship average wait-time days	Overall average wait-time days
Atlantic Fleet			
Enterprise (1999) ^a	7.2	57.2	29.1
Kennedy (1999)	9.3	39.7	21.4
Truman (2000)	9.6	55.5	28.4
Pacific Fleet			
Constellation (1999)	4.1	39.1	16.2
Stennis (2000)	17.7	54.5	32.5
Lincoln (2000)	10.6	46.9	23.8
Total average wait-time	9.9	49.6	25.6

Source: GAO analysis of Navy data.

^aThe Enterprise battle group deployed in October 1998, the first month of fiscal year 1999.

⁹ The Navy has used a wait-time goal of 135 hours, or about 5.6 days, for supplying high-priority parts to ships outside the continental United States. This number is based on an average of the times needed to fill parts requisitions from both onboard ship inventories and off-ship sources. It assumes that 65 percent of all requisitions are filled from onboard inventories within 2 hours and the remaining 35 percent are filled from off-ship sources within 16 days.

¹⁰ These are parts needed for immediate maintenance-related use.

Navy supply officials said they are concerned about the lengthy average wait-time data being reported and are analyzing how this response time can be shortened. They were especially concerned that the number of days required for getting the parts to do the repair work seemed higher than what would be reasonable.

The best of the Navy's wait-time performance is for parts that are needed to repair high-priority, mission-critical equipment. Navy supply officials said that wait-times of about 12 to 14 days for these critical parts are about the best the Navy is achieving because it uses expeditors to locate the parts and it employs premium transportation to deliver the parts to the ships. For example, a ship will send a requisition for a critical part to a shore-based team whose job is to determine quickly if the part is available anywhere in the military supply system or elsewhere, and identify the fastest mode of transportation available (usually commercial overnight delivery) to an overseas point. The Navy will then pick up the part for final delivery to the ship while it is either in port or at sea.

Inaccurate Configuration and Demand Data Contribute to Unmet Supply Goals

Our analysis identified two key problems that contribute to the Navy's inability to achieve its supply goals for deployed ships: inaccurate ship configuration records and incomplete, outdated, or erroneous historical parts demand data. The Navy uses these data in models that estimate the types of parts (range) and the number of each part (depth) that should be stocked on board a ship during its deployment. However, because of data inaccuracies, the ships may stock all of the parts they are allowed to carry but still find they cannot fill a large number of parts requisitions from onboard inventories, thus failing to meet the Navy's supply performance goals.

Ship Configuration Records Are Often Inaccurate

Navy headquarters and fleet officials acknowledge that the accuracy of ship configuration data is a serious concern. Specifically, they said that (1) ship configuration records are not always updated in a timely manner when equipment or weapons systems are modified and (2) required configuration audits are not conducted regularly to ensure that configuration data correspond with the equipment or weapons systems on board. The Navy identifies current and accurate configuration data as the cornerstone of logistics support to its ships. Configuration records provide a detailed description of the characteristics, including dimensions and technical information, of each piece of equipment or weapon system on board the ship. This information is used in allowance models to prepare a Coordinated Shipboard Allowance List (COSAL).

The allowance list identifies the individual spare parts related to each piece of equipment or weapon system on board. Ships depend on accurate configuration records to ensure that, among other things, the right spare parts and special tools, along with the proper manuals and other documentation, are available on board ship.

Navy officials said that while it is difficult to attribute any one cause to spare parts shortages on board, inaccurate ship configuration records are a major problem. If inaccurate configuration records are used in allowance models, the resulting allowance lists may identify some parts that should be stocked but that do not match the equipment that is actually on board. As a result, repair crews could requisition a part for a failed piece of equipment but find that the part is not on the allowance list and, thus, not in stock. The requisitions data from our sample of 6 battle group deployments showed that about 17.3 percent of the 60,365 unfilled requisitions were for parts that were not on the ships' allowance parts lists (see app. III).

One reason that ship configuration records are not current or accurate is that they are not updated or changed, as required, when equipment or systems are installed, removed, or modified. This problem can occur on both new and older ships. According to Navy supply and fleet officials, the allowance lists for new ships are often based on the configuration of the first ship to be built in the production line, and subsequent changes to follow-on ships' configurations are not always documented. Thus, a ship's actual configuration could change—and the records not be modified—even before the ship is delivered from the shipbuilder. On older ships, the equipment and systems are frequently upgraded or replaced without properly updating configuration data because the procedures in place to change configuration records as equipment is changed are not always followed. For example, when equipment is installed, removed, or modified by contractors, ship personnel do not always promptly or accurately enter these changes into the ship's configuration database in order that the spare parts required to support the altered equipment can be ordered.

Moreover, the Navy has not performed the configuration audits it has identified as needed to ensure that configuration data for equipment

and weapons systems on board are accurate.¹¹ According to Navy officials, these audits are supposed to be done periodically but none were conducted between 1995 and 2000 because of budget constraints. Officials said they are beginning to perform configuration audits again and are developing an audit program, but its implementation will depend on the funding available and whether funding is earmarked specifically for audits. The officials estimated that a viable program might cost about \$500,000 a year. Without these audits, the extent of the configuration records' accuracy will remain unclear.

While audits have not been conducted for a period of time, validations—which are more in-depth than audits—of ships' configuration data have revealed problems with their accuracy. The Navy performs validations to establish the precise configuration of critical systems and equipment that is experiencing problems and corrects the configuration data (e.g., items are added or deleted) to reflect what is actually found on board the ships. Seven Pacific Fleet validations completed between October 2002 and January 2003 identified inaccuracies averaging 37 percent of the records reviewed. For example, Navy Pacific Fleet officials provided us with information about a configuration record validation of a new ship delivered to the fleet. The validation identified 901 errors (588 added and 313 deleted records) in the selected systems and equipment, or about 39 percent of the 2,337 configuration records that were reviewed. On an older aircraft carrier, a January 2003 validation identified 3,712 errors (1,790 added and 1,922 deleted records) in the selected systems and equipment, or about 43 percent of 8,555 configuration records reviewed.

Parts Demand Data Are Frequently Incomplete and Out-of-Date

In addition to inaccurate ship configuration information, the Navy frequently uses incomplete, outdated, or erroneous historical demand data in its parts allowance models. This can lead to incorrect estimates of the number of parts needed during a deployment period and result in unmet supply goals. Historical parts demand data provides the projected failure rates or actual replacement rates for spare parts over a long period of time. Each repair part listed on the allowance list is expected to fail at some point in normal ship operations during deployment and is a potential

¹¹ The Navy Sea Systems Command has set a goal of 95 percent accuracy in its configuration data for ships. Ships can have 35,000 to 125,000 configuration records each. An audit entails examining a randomly selected sample of configuration records and actual equipment installed onboard and comparing them with each other for accuracy. COMNAVSURFLANT/COMNAVSURPAC Instruction 4400.1J, dated Aug. 17, 2000.

allowance item. However, only those parts with sufficiently high projected failure rates or actual replacement rates, along with items required for planned maintenance or for safety measures, will normally be authorized as onboard repair parts.

According to Navy officials, data on parts' failure rates are supposed to be accurately, promptly, and continuously updated, but this updating does not always happen. In some cases, ship or shore personnel may not report that a particular spare part has been used and, thus, the information does not get into the supply system database. As a result, the Navy's parts allowance list will be based on incomplete, outdated, or erroneous historical failure-rate data and the ship will stock too few or too many spare parts of a particular type.

Our analysis of the requisitions on board deployed battle group ships revealed that about 38 percent of the 60,365 unfilled requisitions were mainly for parts that were on the allowance list, but were not in stock when requisitioned (see app. III). Navy officials told us that this problem could result partly from inaccuracies in the demand data that are used to develop allowance lists. Officials also suggested that it could stem from the inability of a ship's crew to obtain a high percentage of the spare parts on their allowance lists prior to deployment. However, our analysis showed that, at deployment, Navy ships generally are stocked with a high percentage of the types of parts (range) and the quantities of parts (depth) that are on their allowance lists. Supply officials from the Navy's Pacific Fleet told us that their goal for surface ships was to stock 93 percent of the range and 90 percent of the depth identified on their allowance lists and that deploying ships, which were usually given a high funding priority, generally deployed with percentages higher than these.

As table 3 shows, our analysis of data for the Lincoln battle group (Pacific Fleet) deployed in fiscal year 2002 indicated that the ships were stocked with an average of 98.1 percent of the different types of parts (range) and an average of 93.1 percent of the quantities of each part (depth) that were on their allowance lists, which included the parts expected to be needed during the first 90 days of deployment (July to September 2002). In contrast, during this period, an average of only 58.3 percent of the ships' requisitions were filled from parts carried on board. This assessment shows that, although these ships carried a high percentage of the types and quantities of allowed items, they continued to fall short of meeting the Navy's supply effectiveness rate goal of 65 percent.

Table 3: Percentages of Parts Types and Quantities Allowed to Be Stocked Onboard and the Parts Supply Effectiveness Rates for Lincoln Battle Group Surface Ships during the First 90 Days of Deployment, July-September 2002

Lincoln battle group ships	Percent of types allowed (range)	Percent of quantities allowed (depth)	Supply rate ^a
Camden	97.9	96.4	53.0
Fletcher	97.5	83.4	37.2
Mobile Bay	97.0	96.5	59.0
Paul Hamilton	99.1	98.8	78.7
Reuben James	98.9	87.8	56.6
Shiloh	98.6	95.2	60.1
Average	98.1	93.1	58.3

Source: GAO analysis of Navy data.

^aThe supply rate is the percentage of parts requisitions that could be filled from stocks on board ship.

Spare Parts Supply Problems Can Affect Ship Operations and Mission Readiness and Increase Costs

The Navy's spare parts supply problems can delay the completion of needed maintenance and repair jobs on deployed ships and can affect their operations and mission readiness, although their precise impacts are not always well defined. Our analysis of data on more than 50,000 maintenance work orders for 6 battle group deployments in 1999 and 2000 indicated that about 58 percent were delayed because the needed repair parts were not available on board ship. Our closer analysis of maintenance work orders and casualty reports for one battle group indicated a discrepancy in reporting the extent to which equipment failures occurred and, thus, the extent to which these problems were reflected in readiness assessments is unclear. The Navy's supply problems also have an impact on costs. Although the exact amounts have not been quantified, Navy officials recognize that they incur substantial costs to obtain needed parts from off-ship supply sources. The Navy also expends substantial funds—totaling nearly \$25 million for the six ships we reviewed—to maintain large inventories that are not requisitioned during deployments because it has given low priority to identifying and purging unneeded spare parts from ship inventories.

Lack of Spare Parts Can Delay Needed Ship Repairs

Shortages of required parts can often delay the completion of needed maintenance and repair jobs. Our analysis of more than 50,000 maintenance work orders opened during 6 recent battle group deployments indicates that about 29,000 (almost 58 percent of the total) could not be completed because one or more needed repair parts were not on board ship. Table 4 summarizes this information.

Table 4: Impact of Spare Parts Shortages on Completion of Maintenance Jobs for Selected Fiscal Years 1999 to 2000 Deployments

Battle group (year deployed)	Total number of jobs	Number of jobs completed with all parts onboard	Percent of jobs completed with all parts onboard	Number of jobs requiring off-ship parts	Percent of jobs requiring off-ship parts
Atlantic Fleet					
Enterprise (1999) ^a	12,607	4,727	37.5	7,880	62.5
Kennedy (1999)	13,362	5,256	39.3	8,106	60.7
Truman (2000)	9,553	4,118	43.1	5,435	56.9
Pacific Fleet					
Constellation (1999)	4,501	2,318	51.5	2,183	48.5
Stennis (2000)	5,557	2,823	50.8	2,734	49.2
Lincoln (2000)	4,780	2,123	44.4	2,657	55.6
Total/average	50,360	21,365	42.4	28,995	57.6

Source: GAO analysis of Navy data.

^aDeployed in October 1998.

Navy fleet officials told us that a maintenance job is generally not started until all the needed parts are on board ship. This delay is due to the time and labor involved in tearing down equipment and possibly losing parts if equipment is left partially disassembled awaiting repair.

Data Unclear on Impact of Spare Parts Shortages on Ship Operations and Mission Readiness

A complete picture of the impact of the Navy's spare part shortages, however, is unclear because the Navy's two forms of reporting on the extent to which significant equipment malfunctions affect a ship's operations and mission readiness are inconsistent. The two forms of reporting are high-priority maintenance work orders and casualty reports. The Navy uses four priority codes for maintenance work, with priorities 1, 2, and 3 considered high priority.¹² High priority work is defined as critical, extremely important, or important to a ship's essential equipment and systems, operations, or mission (see app. II for complete definitions of these codes). Navy maintenance reporting instructions require that any maintenance job with one of these three priority codes should generate a casualty report. According to Navy guidance on casualty reports, they are directly related to a unit's readiness reporting and

¹² Ships' Maintenance and Material Management (3-M) Manual, OPNAV Instruction 4790.4C, Nov. 7, 1994.

identify the ship's equipment status and impact on the ship's operations and mission readiness.¹³ Where casualty reports are issued, these problems are to be reflected in a ship's readiness reporting. Our review of about 4,000 casualty reports issued for deployed Pacific Fleet ships from 1999 to 2001 indicated that they generally resulted in degraded ship readiness, as reported by the Status of Resources and Training System (SORTS).¹⁴ SORTS is used DOD-wide to report the degree to which a unit is capable of undertaking its assigned wartime missions.

However, our analysis of ship maintenance work orders and casualty reports for one battle group (Truman) in the Atlantic Fleet deployed in fiscal year 2000 showed a discrepancy between the number of work orders with priority 1, 2, or 3 and the number of casualty reports that were filled out when a job was assigned one of these priority codes. The work orders indicated that, of 5,435 total maintenance jobs, 2,635 were identified as priority 1, 2, or 3. Although there should have been a similar number of casualty reports, only 906, or one-third of the 2,635, were issued for these ships during this period of time. One must assume that a more complete reporting of casualty reports, as required for high priority maintenance work orders, would provide the basis for a more complete assessment of readiness.

A similar discrepancy occurred between the number of high-priority work orders and casualty reports issued for maintenance jobs on surface ships in the Pacific Fleet between fiscal years 1995 and 2002. According to a Pacific Fleet maintenance analyst, of about 1 million surface ship maintenance jobs coded with priority 1, 2, or 3, only about 50,000 casualty reports, or about 5 percent, were issued.

Although Navy guidance calls for up-to-date and accurate casualty reports, Navy officials said that the final decision on whether to submit a casualty report is left to the judgment of the ships' commanders and is based on their perception of the importance of the degraded equipment to the ships' assigned missions and the status of redundant equipment that the ships carry. Navy officials said that the number of casualty reports that are issued should be higher, but they suggested that commanders' concerns that a high number of such reports could reflect negatively on their

¹³ Operational Reports NWP 1-03.1, (Formerly NWP 10-1-10, letter of promulgation Nov. 1987).

¹⁴ Status of Resources and Training System (SORTS), NWP 10-1-11 (Rev. A).

leadership may limit the number of reports that are issued. For example, we were told that casualty reports are usually not generated when ships are getting ready to deploy; if too many are generated, it might be seen as a failure of the ships' command leadership.

Some ships that issued only a few minor casualty reports were found, on closer inspection, to have significant ship operations and mission readiness problems. For example, Navy ships are required to have periodic inspections to determine if they are fit for further service and to identify any conditions that limit their capability to carry out assigned missions.¹⁵ Inspection reports we reviewed identified various deficiencies,¹⁶ such as the failure of equipment to meet performance and safety requirements or the need for excessive maintenance resources. During an inspection in February 2002 of a destroyer forward-deployed in Yokosuka, Japan, which had issued 16 low-priority casualty reports prior to the inspection, inspectors gave the ship an unsatisfactory rating—the lowest possible rating—in the areas of self-defense, full power, and steering tests; they also found that it had significant material deficiencies and equipment operational capabilities discrepancies. Inspectors told us such discrepancies between casualty reporting and the actual conditions found during the inspections of the ships were not uncommon.

Navy Incurs Substantial Costs to Obtain Off-Ship Parts and Maintain Large Inventories

Another effect of the Navy's spare parts supply problems is increased costs. The Navy expends additional funds to obtain needed spare parts from off-ship sources. To get these parts, it must identify where they are available (e.g., from a shore-based Navy supply center or a commercial vender) and then transport them to the ship.

The Navy also incurs substantial costs to carry large parts inventories that are not requisitioned. Our analysis of data for six ships in the Lincoln battle group (Pacific Fleet) during deployment in 2002 showed that the ships requisitioned only a small percentage of the different types of parts carried on board. As shown in table 5, the ships carried a total of 62,727 different types of parts. By the end of 6 months, the supply crews

¹⁵ Title 10 U.S.C. Section 7304 requires a board of Naval officers to conduct a material inspection of all naval ships at least once every 3 years, if practicable, and to report when, as a result of a material inspection, a ship is found unfit for further service.

¹⁶ A deficiency is an item that requires corrective action to bring the material condition of the ship into compliance with required standards.

had received 10,471 requisitions for spare parts and filled 6,549 of them from onboard stocks. This number (6,549) represented 10.4 percent of the total part types carried on board. Navy fleet officials acknowledged that ships generally carry many times more parts than are requisitioned during their deployments and indicated that there are opportunities to reduce inventories without adversely affecting ship operations if more accurate data was available.

Table 5: Number of Different Types of Parts Carried Compared with Total and Filled Requisitions for Lincoln Battle Group Surface Ships after 6 Months of Deployment, July-December 2002

Lincoln battle group ships	Number of all part types carried	Total requisitions		Requisitions filled from onboard stocks	
		Number	Range (percent)	Number	Percent of all part types used
Camden	7,797	1,443	18.5	843	10.8
Fletcher	11,744	1,717	14.6	689	5.9
Mobile Bay ^a	12,291	2,167	17.6	1,637	13.3
Paul Hamilton	11,815	1,652	14.0	1,322	11.2
Reuben James	7,573	1,733	22.9	1,018	13.4
Shiloh	11,507	1,759	15.3	1,040	9.0
Total	62,727	10,471	16.7	6,549	10.4

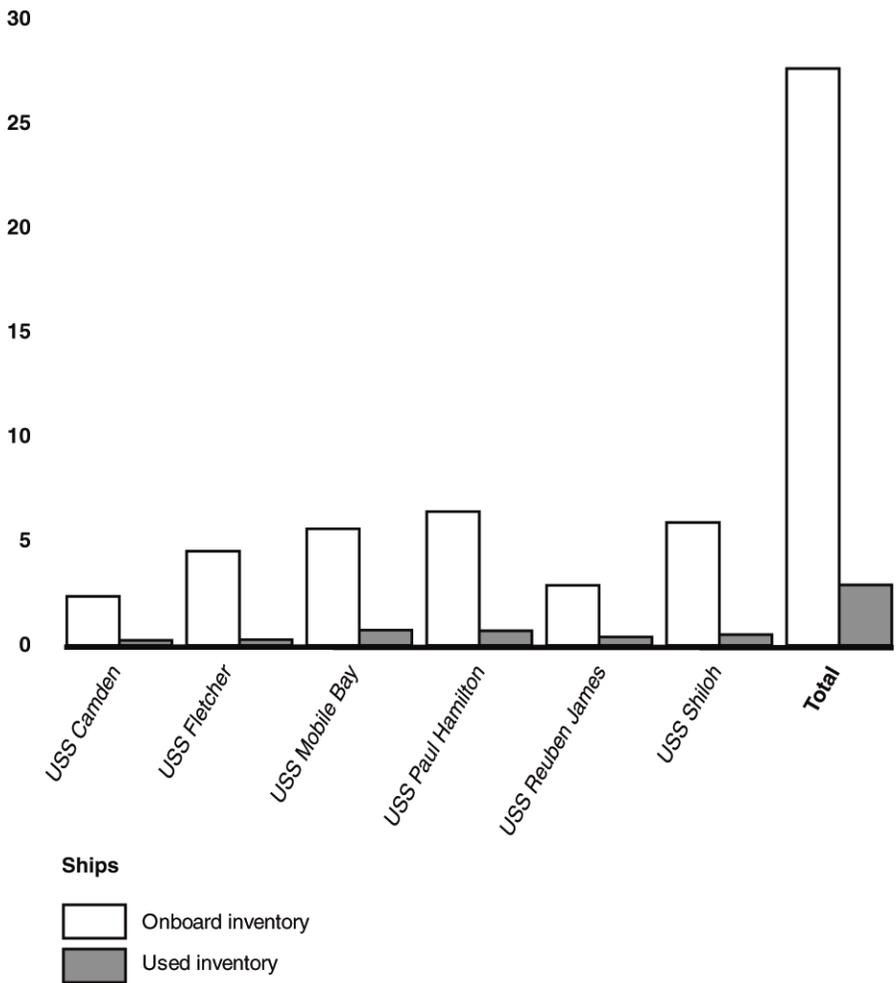
Source: GAO analysis of Navy data.

^aThe Mobile Bay data overstate the number of onboard requisitions filled because the ship filed 452 individual requisitions for bulk issue items (light bulbs) that should have been included on a smaller number of requisitions for larger quantities, according to type command supply officials.

Furthermore, the Navy spent far more to carry this inventory of spare parts than it spent for the parts that it actually used during the Lincoln battle group's 6-month deployment in 2002. Using available Navy data on the value of the six ships' onboard inventories, we estimated the value of the inventory carried onboard ship be about \$27.6 million and the value of the used inventory to be about \$2.9 million. See figure 1.

Figure 1: Estimated Value of the Spare Parts Inventory Carried Onboard and Actually Used during First 6 Months of Deployment on Lincoln Battle Group Surface Ships, Fiscal Year 2002

Dollars in millions



Source: GAO analysis of Navy data.

According to Navy supply officials, to minimize the inventory of unneeded spare parts carried on board ships, ships could purge their existing inventories periodically and revise the allowance parts lists based on accurate configuration records, demand data, and allowance models. The revised allowance would identify both shortages of needed parts and excesses of unneeded parts. They said that allowance lists used to be reviewed and updated periodically, but these reviews are no

longer performed. Although officials acknowledged that the inventory of unneeded parts should be minimized, they said a higher priority has been placed on correcting the shortages of needed spare parts because of their impact on ships' operations and mission readiness. They said that the existing inventories of unneeded parts have already been purchased, and the costs cannot be recouped.

Conclusions

The Navy's long-standing failure to meet its spare parts supply performance goals has led to shortages of needed parts on board ships and some degradation in ships' operations and mission readiness during long deployments at sea. These shortages stem from the Navy's inability to determine, in a reliable way, what types of spare parts and how many of each type need to be stocked on board ship. The Navy uses inaccurate, out-of-date, or incomplete ship configuration and historical demand information to develop the parts allowance lists that identify what repair parts, manuals, and other related items a ship should carry in its onboard inventory. Even though a ship may stock almost all of the parts on the allowance list, it is likely to fall short of meeting the Navy's supply performance goals because the data used to develop the allowance lists are inaccurate. When needed parts are not available on board, a large number of repair jobs are delayed and equipment is not functional—sometimes for weeks or months—until the ships' crews can obtain the parts from off-ship sources. Moreover, the Navy may not have a complete picture of the actual impact that equipment downtime has on the ships' operations and mission readiness because of discrepancies in the reporting systems the Navy uses to monitor these problems.

The Navy's spare parts supply problems also substantially increase costs. Because of inaccuracies in the information the Navy uses to develop its allowance lists, it often stocks the wrong types or the wrong quantities of parts on board ships. As a result, the Navy has to spend additional money to obtain the parts it needs from off-ship sources, often incurring high expenses to locate the parts and transport them to the ships. It also expends substantial funds to maintain large inventories on board its ships that are not requisitioned during deployments. However, the Navy has given low priority to purging unneeded parts from its ships' inventories and, instead, has focused on purchasing additional spare parts to avoid future shortages.

Until the reliance on poor ship configuration records and historical demand information to identify what spare parts should be carried on board is broken, the Navy's deployed ships will continue to experience

critical spare parts shortages that undermine their ability to fulfill their missions at sea.

Recommendations for Executive Action

In order to improve supply availability, enhance operations and mission readiness, and reduce operating costs for deployed ships, we recommend the Secretary of Defense direct the Secretary of the Navy to

- develop plans to conduct periodic ship configuration audits and to ensure that configuration records are updated and maintained in order that accurate inventory data can be developed for deployed ships;
- ensure that demand data for parts entered into ship supply systems are recorded promptly and accurately as required to ensure that onboard ship inventories reflect current usage or demands;
- periodically identify and purge spare parts from ship inventories to reduce costs when parts have not been requisitioned for long periods of time and are not needed according to current and accurate configuration and parts demand information; and
- ensure that casualty reports are issued consistent with high priority maintenance work orders, as required by Navy instruction, to provide a more complete assessment of ship's readiness.

Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD concurred with three recommendations and concurred with the intent of the fourth recommendation, but not its specific action. DOD's written comments are reprinted in their entirety in appendix IV.

In concurring with our first recommendation, DOD said that, although the Navy has an audit plan to look at current ship configurations and provide updated allowance listings, the Navy needs to be more aggressive in following up on configuration changes to ensure that the configuration records on board ship match those in the Navy's main configuration database. At the time of our review, the procedures had not been validated and reconciled, for example, with the high percentages of inaccuracies identified during validations done to identify and correct problems; moreover, sufficient funding to implement the program was not assured. DOD also noted that the Navy recently set up a Maritime Allowancing Working Group that is undertaking a comprehensive review of its current inventory and allowance practices, including ship configuration management. However, at the time of our review, the Navy had not established time frames for reporting on this effort.

Although DOD concurred with our second recommendation, it asserted that our report does not adequately substantiate our claim about the accuracy of demand data. In our report, however, we cited Navy officials who told us that spare parts' failure rates, which rely on demand data, are not always updated promptly or accurately. Moreover, 60,000 requisitions for spare parts were not on ships in 6 battle groups deployed in fiscal years 1999 and 2000 either because they were not on allowance parts lists or were on these lists but were not in stock when requisitioned (see app. III). Navy officials told us that such shortages occur in part from relying on inaccurate demand data. DOD pointed out that many items on the lists do not qualify for allowances. They said that these parts are not stocked on board because of a ship's designated repair capability, the results of the readiness optimization calculation used in the sparing model, and the forecast for demand falling below the sparing threshold. However, these determinations also rely on accurate and timely demand data.

In concurring with our third recommendation, DOD said that the Navy needs to undertake a more comprehensive program to identify and, when appropriate, purge excess spare parts from ship inventories, but it added that such efforts should not be based solely on parts demand history. In our recommendation, we said that decisions to remove spare parts from ship inventories should be based on both demand data and current and accurate ship configuration information. DOD correctly noted that critical items related to safety requirements and readiness optimization should not be removed because they could jeopardize a ship's safety and mission. We support the Navy's plan to focus initially on identifying and purging those spare parts that support systems that are no longer installed on board ships.

DOD concurred with the intent of our fourth recommendation that called for the Navy to ensure that casualty reports are issued consistent with high priority maintenance work orders as required by Navy instruction, to provide a more complete assessment of ship's readiness. We based our recommendation on the Navy's current maintenance instruction that calls for casualty reports to be issued for certain high-priority maintenance actions according to the level of importance that the failed equipment has on a ship's operations and mission. DOD said that casualty reports and maintenance orders are inherently different in purpose, and the instructions should be updated to ensure that casualty reports are generated when deemed appropriate to get the attention required from the logistics system. We believe that, while the instruction may need to be updated or revised, the maintenance data that are gathered under the current instruction are both relevant and important to the Navy's ability to

assess fully a ship's operations and mission readiness. In its response, DOD said the Navy has emphasized the need to use standardized reporting procedures and that fleet commanders have asked their commanding officers to report on ship status accurately and in a timely manner through the Status of Resources and Training System report.

We are sending this report to other interested congressional committees; the Secretary of Defense; the Secretary of the Navy; and the Director, Office of Management and Budget. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov/>.

Please contact me on (202) 512-8412 if you or your staff has any questions concerning this report. Key staff members who contributed to this report were Allan Roberts, Lionel Cooper, Gary Kunkle, Joel Aldape, Odilon Cuero, Dale Yuge, Jean Orland, and Nancy Benco.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'W. Solis', with a large, stylized initial 'W' and a long, sweeping underline.

William M. Solis
Director, Defense Capabilities
and Management

Appendix I: Scope and Methodology

To identify the extent of spare parts shortages on deployed Navy ships, we focused on spare parts requisitions by deployed battle groups in the Atlantic and Pacific fleets during fiscal years 1999-2002. We analyzed the Navy's goal and supply effectiveness data from its Maintenance and Material Management (3-M) Database Open Architectural Retrieval System by identifying supply requisitions for repair parts that were either filled or not filled from inventories on board deployed ships. We reviewed reports regarding the Navy's overall ability to fill onboard spare parts requisitions on deployed ships between 1982 and 2001 in order to identify any long-term trends. We also reviewed the Navy's goals and data on the average customer wait-time for critical and noncritical parts on deployed ships during fiscal years 1999 and 2002.

To determine the reasons for spare parts shortages, we analyzed Navy data on unfilled requisitions for 6 battle groups deployed during fiscal year 1999-2000. We analyzed and categorized the reasons for parts shortages based on the reported data. We also examined Navy policies and procedures regarding ships' spare parts, including the need for accurate data and the impact of inaccurate data on the allowed parts carried on deployed ships. We examined and discussed with Navy officials the procedures that are used to ensure that accurate ship configuration and demand data records are maintained and the circumstances that can affect this accuracy. Moreover, we analyzed the reasons for the differences between the spare parts provisions, (e.g., the range and depth) and the amounts that are actually used to fill spare parts requisitions in order to gain a better understanding of why the Navy's provisioning process does not more effectively and efficiently meet the deployed ships' spare parts requirements.

To examine the impact of spare parts shortages on deployed ships' operations and mission readiness, we analyzed data on maintenance work orders and requests for spare parts that were not available on board the 6 battle groups during selected fiscal year 1999-2000 deployments. Also, we reviewed the Navy's criteria for assessing the effects of failed equipment on a ship's ability to accomplish its mission, particularly the standards for determining what maintenance work orders result in casualty reports. We then applied the criteria to maintenance work orders for the Truman (Atlantic Fleet) battle group deployed in fiscal year 2000 to identify those that should have resulted in casualty reports reflecting ship operations and mission readiness. We compared the results of this analysis with data on Navy casualty reporting to determine if the number of failed equipment items meeting the criteria for reporting mission readiness degradation were reported in accordance with Navy criteria, policies, and

procedures. We also reviewed data on casualty reports and SORTS data submitted by deployed Pacific Fleet surface ships during calendar years 1999, 2000, and 2001 to determine if the casualty reports were reflected in SORTS equipment readiness reporting. In addition, for six ships in the Lincoln (Pacific Fleet) battle group deployed in fiscal year 2002, we identified the total number of parts carried, both range and depth, and compared this to the number of requisitions submitted and filled from onboard inventories. We compared the Navy's data on the estimated value of the onboard inventory with the estimated value of the inventory actually used in order to gain insight into the dollar impacts of carrying parts that are not used during ships' deployments. We discussed the results of this analysis with Navy headquarters and fleet officials.

We reviewed Navy briefings and prior GAO reports regarding the effects of parts shortages on Navy supply and maintenance actions, and we discussed the Navy's goals and initiatives intended to assess the effects of parts shortages on ships' operations and military readiness with Navy officials at the various locations we visited. These locations included the Naval Warfare Assessment Station, Corona, Calif.; the Fleet Technical Support Center, the Naval Air Force, and the Naval Surface Force, U.S. Pacific Fleet, San Diego, Calif.; the headquarters, U.S. Pacific Fleet and the Submarine Force, U.S. Pacific Fleet, Pearl Harbor, Hawaii; the Naval Supply Systems Command, its Naval Inventory Control Point, and the Naval Sea Logistics Center, Mechanicsburg, Pa.; and Naval Sea Systems Command and the office of the Chief of Naval Operations, Washington D.C.

We performed our work from July 2002 to May 2003 in accordance with generally accepted government auditing standards.

Appendix II: Navy Work Order Priority Code Descriptions

According to Navy maintenance reporting instructions, Navy ship crews are required to identify maintenance work order priorities.¹ High-priority (Priority 1, 2, and 3) work orders affect equipment that is critical, extremely important, or important for a ship's operation. Any maintenance job with one of these three priority codes is required to generate a casualty report (CASREP). Casualty reports are directly related to a unit's readiness reporting and identify the ship's equipment status and impact on the ship's operations and mission readiness.²

Priority 1—Mandatory: Critical safety or damage control item. Required for performance of ship's mission. Required to sustain bare minimum acceptable level of human needs and sanitation. C-4 CASREP (Casualty Report) on equipment.

Priority 2—Essential: Extremely important safety or damage control item. Required for sustained performance of ship's mission. Required to sustain normal level of basic human needs and sanitation. Required to maintain overall integrity of ship or a system essential to ship's mission. Will contribute so markedly to efficient and economical operation and maintenance of a vital ship system that the pay-off in the next year will overshadow the cost to accomplish. Required for minimum acceptable level of preservation and protection. C-3 CASREP on equipment.

Priority 3—Highly Desirable: Important safety or damage control item. Required for efficient performance of ship's mission. Required for normal level of human comfort. Required for overall integrity of equipment or systems that are not essential, but are required as backups in case of primary system failure. Will contribute so markedly to efficient and economical operation and/or maintenance of a vital ship system that the payoff in the next year will at least equal the cost to accomplish. Will effect major reduction in future ship maintenance in an area or system that presently cannot be maintained close to acceptable standards. Required to achieve minimum acceptable level of appearance. C-2 CASREP on equipment.

¹ Ships' Maintenance and Material Management (3-M) Manual, OPNAV Instruction 4790.4C, Nov. 7, 1994.

² Operational Reports NWP 1-03.1 (formerly NWP 10-1-10, letter of promulgation Nov. 1987).

**Appendix II: Navy Work Order Priority Code
Descriptions**

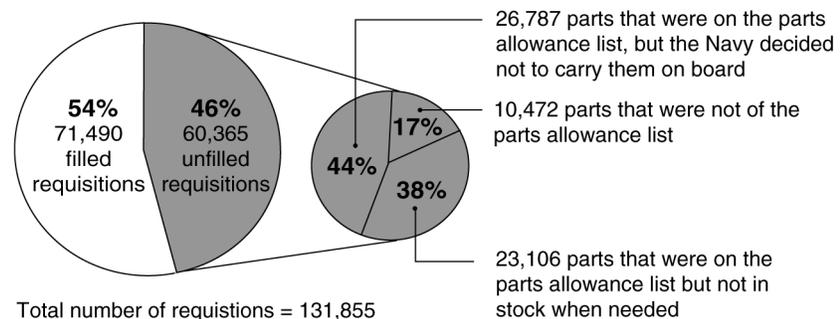
Priority 4—Desirable: Some contribution to efficient performance.
Some contribution to normal level of human comfort and welfare.
Required for overall integrity of other than an essential system or its
backup system. Will contribute to appearance in an important area.
Will significantly reduce future maintenance.

Appendix III: Navy Reasons for Spare Parts Not Onboard Deployed Ships

Our analysis of the 60,365 unfilled requisitions from the deployments of six battle groups in fiscal years 1999 and 2000 showed that there are a number of reasons why the Navy might not stock needed parts on board ship (see fig. 2). These unfilled requisitions represented 46 percent of all 131,855 requisitions submitted during these deployments. Our analysis of the reasons identified in the Navy's database showed that

- about 17.3 percent (10,472) of the unfilled requisitions were for parts that were not on the allowance parts list;
- about 44.4 percent (26,787) of the unfilled requisitions were for parts that were on the allowance parts list but the Navy decided not to carry them on board; and
- about 38.3 percent (23,106) of the unfilled requisitions were for parts that were on the allowance parts list, the Navy decided to carry them, but they were not in stock when needed.

Figure 2: Spare Parts Requisitions Filled and Unfilled for Six Selected Battle Groups, Fiscal Years 1999-2000, According to Reasons Identified by the Navy



Total number of requisitions = 131,855

Source: GAO analysis of Navy data.

Note: Because of rounding, percentages may not add to 100.

Appendix IV: Comments from the Department of Defense



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

August 18, 2003

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

Dear Mr. Solis:

This is the Department of Defense (DoD) response to the GAO draft report, "DEFENSE INVENTORY: Opportunities Exist to Improve Spare Parts Support Aboard Deployed Navy Ships," dated July 18, 2003, (GAO Code 350210/GAO-03-887).

The Department concurs with recommendations one through three, while concurring with the intent of recommendation four. An explanation of the DoD position is enclosed. The Department appreciates the opportunity to comment on the draft report.

Sincerely,

A handwritten signature in black ink, appearing to read "Diane Morales", is positioned above the printed name.

Diane K. Morales

Enclosure:
As stated



GAO DRAFT REPORT – DATED JULY 18, 2003
GAO CODE 350210/GAO-03-887

“DEFENSE INVENTORY: OPPORTUNITIES EXIST TO IMPROVE SPARE PARTS
SUPPORT ABOARD DEPLOYED NAVY SHIPS ”

DEPARTMENT OF DEFENSE COMMENTS
TO THE RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Secretary of the Navy to develop plans to conduct periodic ship configuration audits and to ensure that configuration records are updated and maintained in order that accurate inventory data can be developed for deployed ships. (p.25/GAO Draft Report)

DoD RESPONSE: Concur. Configuration accuracy is a critical element in providing accurate spare parts support. Navy does have an audit plan that looks at the current configuration of a ship and provides updated allowance listings via automated files based on the latest configuration data. Navy does agree that it needs to be more aggressive in following up on these configuration changes to ensure the configuration files on board the ship match those on file in the main configuration database.

In addition to the ongoing efforts regarding the configuration management audit plan, a Maritime Allowancing Working Group (MAWG) was established in 2002 at the Fleet’s request to perform a comprehensive review of the current inventory strategy and allowance processes including Configuration Management.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Secretary of the Navy to ensure that demand data for parts entered into ships supply systems are recorded promptly and accurately as required to ensure that onboard ship inventories reflect current usage or demands. (p.25/GAO Draft Report)

DoD RESPONSE: Concur. Good demand reporting is essential but this report does not adequately substantiate the assertion regarding demand data accuracy.

Regarding the 38% of the unfilled requisitions contained on the allowance list but not in stock, the report appears to assume this is due entirely to inaccurate data reporting. This is not always the case and many items listed on Allowance Parts Listings (APLs) do not qualify for allowances for the following reasons: The ship’s designated repair capability; results of the readiness optimization calculation used in the sparing model; and the forecasted demand falling below the sparing threshold.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense direct the Secretary of the Navy to periodically identify and purge spare parts from ship inventories when they have not been requisitioned for long periods of time and are not needed according to current and accurate configuration and parts demand information. (p.25/GAO Draft Report)

DoD RESPONSE: Concur. It is agreed that a more comprehensive effort must be applied to identifying excess material, and when deemed appropriate, purge those items from the ship's inventory.

We do not agree that the criteria for purging material should be based solely on demand history. Processes currently exist that judiciously remove parts based on several factors, to include demand, criticality, safety, and cost. There is currently an automated process that automatically triggers removal of the spare based on configuration changes. Typically, many items are onboard in support of safety requirements and readiness optimization, and although some have little or no demand history, removal of these critical items could jeopardize the safety of our sailors and the operational mission of the ships. The Navy will focus its attention and initial efforts on identifying and purging those spares parts that support systems no longer installed on ships.

RECOMMENDATION 4: The GAO recommended that the Secretary of Defense direct the Secretary of the Navy to ensure that casualty reports are issued consistent with high priority maintenance work orders, as required by Navy instruction, to provide a more complete assessment of ship's readiness. (p. 25/GAO Draft Report)

DoD RESPONSE: Concur with intent. It is agreed that that the Navy's current maintenance instruction needs to be updated to ensure that Casualty Reports are generated only when deemed appropriate to ensure they get the level of attention required of the logistics system. It is not agreed that casualty reports should be issued consistent with maintenance orders as discussed on page 19 of this report.

Casualty Reports and maintenance orders are inherently different in purpose. Critical repairs completed within 48 hours are generally not to be reported on a casualty report, and there is little correlation between casualty report severity and maintenance order priority as suggested by the draft report. Specifically, a priority 1 maintenance order might qualify as a C2 vice C3/C4 Casualty Report if the degradation applies to secondary mission equipment. Similarly, a primary mission system requiring maintenance may or may not justify a C2 Casualty Report depending on the amount of redundancy within that system. That being said, the Navy has emphasized that standardized reporting procedures must be adhered to and the Fleet Commanders have notified their Commanding Officers to ensure they report the status of their ships accurately and on time via the Status of Resources and Training System (SORTS) report.

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E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

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