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BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Secretary Of The Navy

The Navy Can Improve Material Management At Naval Shipyards

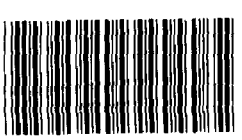
This report discusses a number of ways that the Navy can improve material management at naval shipyards. For example, improvements are needed to

--determine direct material requirements for future ship overhauls,

--minimize shop stores inventories, and

--set organizational goals to measure how well shipyards manage materials.

GAO makes several recommendations designed to improve the management of shipyard materials. The Department of Defense generally agreed with GAO's findings and recommendations and outlined actions planned to improve shipyard material management.



GAO/NSIAD-85-71
MAY 6, 1985

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GENERAL ACCOUNTING OFFICE
REPORT TO THE SECRETARY
OF THE NAVY

THE NAVY CAN IMPROVE MATERIAL MANAGEMENT AT NAVAL SHIPYARDS

D I G E S T

Material inventories at naval shipyards have increased sharply in recent years. Between 1979 and 1984, the inventory value almost doubled, from $250.8 million to $494.6 million. Direct material inventories, valued at about $280.8 million, contain industrial-type materials used in ship overhauls. Shop stores inventories, valued at about $213.8 million, generally contain more commonly used materials, such as paints, bearings, nuts, and bolts.

GAO made this review to determine the effectiveness of material management activities at naval shipyards. In carrying out its review, GAO visited four of the eight naval shipyards. This report discusses several areas where improvements are needed.

DIRECT MATERIAL REQUIREMENTS DETERMINATION PROCESS CAN BE MORE EFFECTIVE

The naval shipyards do not effectively determine direct material requirements for future overhauls because (1) complete and accurate usage data is not collected and (2) historical usage information on prior overhauls is not analyzed. As a result, material shortages and surpluses reduce efficiency and increase costs of shipyard depot maintenance. (See ch. 2.)

Usage information collected by shipyards is inaccurate because it includes unused materials placed in unrecorded stockpiles instead of being returned to the proper inventory location. At the shipyards GAO visited, extensive unused materials were not recorded in official inventory records. Supply officials estimated the value of these materials at one shipyard to be over $14 million. Usage information also is inaccurate because it does not include many items used during overhauls that the shipyard has manufactured.

Tear Sheet

GAO/NSIAD-85-71
MAY 6, 1985

Material planners do not have an adequate system for analyzing historical usage information on prior overhauls in determining requirements for future overhauls. In 1978 the Naval Sea Systems Command (NAVSEA) provided the shipyards an improved automated material requirements planning system but was unsuccessful in getting the shipyards to implement the data analysis part of it. Instead, the shipyards have continued to use local systems, which have proved to be ineffective. NAVSEA is reconsidering whether the planning system should be implemented, modified, or replaced.

One result of ineffective planning has been the accumulation of large amounts of unused materials from prior overhauls. According to shipyard financial reports, unused materials valued at $167 million were accumulated between January 1982 and March 1984. While no specific standards exist, private shipyard, naval shipyard, and NAVSEA officials state that the amount of unused materials should not exceed 5 to 15 percent of what was ordered. Using this criterion, the amount of unused materials could have been reduced by $117 million at the 5-percent level and $43 million at the 15-percent level.

SHOP STORES INVENTORIES CAN BE MANAGED BETTER

The shipyards GAO visited had not performed required physical inventories of shop stores or effectively identified, analyzed, and disposed of excess materials. GAO believes this is a primary reason that the value of excess shop stores materials steadily increased to $77 million at March 1984. (See ch. 3.)

Physical inventories that have been performed have identified inaccurate inventory records. The most recent inventories for two shops at one shipyard indicated that recorded on-hand balances were inaccurate for 82 and 91 percent of the items inventoried. GAO found cases where inaccurate records resulted in orders for materials that were not needed to meet current requirements.

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-217963

The Honorable John F. Lehman
The Secretary of the Navy

Dear Mr. Secretary:

This report points out that the Navy can improve material management at naval shipyards. The Department of Defense furnished written comments on a draft of this report. The comments are included as an appendix and are summarized, where appropriate, in the report.

The report contains recommendations to you on pages 12, 17, and 20. As you know, 31 U.S.C. ¶720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs no later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Chairmen, House Committee on Government Operations, Senate Committee on Governmental Affairs, and House and Senate Committees on Appropriations and on Armed Services; the Secretary of Defense; and the Director, Office of Management and Budget.

Sincerely yours,

Frank C. Conahan

Frank C. Conahan
Director

NAVSEA is initiating actions which address the need to periodically inventory shop stores and to identify, analyze, and properly dispose of excess materials. If properly implemented at the shipyards, these actions should help eliminate the weaknesses GAO identified.

ORGANIZATIONAL GOALS AND INDIVIDUAL PERFORMANCE STANDARDS NEEDED

The shipyards have not been held accountable for implementing systems and procedures provided by NAVSEA to improve material management. The shipyards, in turn, have not held their personnel accountable for implementing prescribed procedures and for improving material management efficiency. As a result, previously identified material management problems remain unresolved. (See ch. 4.)

NAVSEA needs to set clear goals and collect accurate information for measuring how well shipyards manage materials. The type of goals that could be established include the percentage of direct materials ordered after the start of each overhaul, the percentage of unused direct materials after each overhaul, and the percentage of excess shop stores inventories. Once organizational goals are established, the shipyards should include appropriate standards in the performance appraisals of the shipyard employees responsible for material management activities and hold them accountable for meeting these standards.

RECOMMENDATIONS

GAO recommends that the Secretary of the Navy direct the Commander, NAVSEA, to:

--Initiate a one-time special project to have shipyards identify and record all existing unrecorded materials, and retain only those materials allowed by Defense and Navy regulations, return all other needed materials to the supply system, and dispose of materials that are no longer needed.

--Collect accurate information on materials used during overhauls by properly accounting for unused materials upon the completion of each overhaul and by recording all manufactured materials in the historical usage data base.

--Adopt and implement a material requirements planning system that the shipyards can use to analyze historical usage data.

--Require that shipyards, in the interim, implement procedures to analyze actual usage data when ordering materials for future overhauls.

--Ensure that shipyards (1) perform the required physical inventories and (2) properly identify, analyze, and dispose of excess shop stores materials.

--Set organizational goals for each shipyard that address the efficiency and effectiveness of material management activities. Once such goals are set and adequate experience is gained in using them, NAVSEA should require that shipyards include appropriate standards in the performance appraisals of those employees responsible for material management activities and hold them accountable for meeting the standards.

AGENCY COMMENTS

The Department of Defense provided written comments on a draft of this report. The Department generally agreed with GAO's recommendations. (See app. I.)

Contents

ABBREVIATIONS

DOD	Department of Defense
GAO	General Accounting Office
NAVSEA	Naval Sea Systems Command

CHAPTER 1

INTRODUCTION

Material inventories at naval shipyards have increased sharply in recent years. Between 1979 and 1984, the inventory value reported by the Navy almost doubled, from $250.8 million to $494.6 million. For accounting and management purposes, shipyards separate materials into two types of inventories--the direct material inventory and shop stores inventory.

The direct material inventory, valued in September 1984 at $280.8 million, contains industrial-type materials that are generally ordered and set aside for a specific overhaul. The direct inventory includes $50.4 million worth of materials which are no longer designated for a specific overhaul, but are retained because shipyards believe they will be needed in the future. The shop stores inventory, valued in September 1984 at $213.8 million, contains commonly used materials and supplies, such as paints, bearings, nuts, and bolts. Shop stores materials are generally ordered by shipyard supply departments on the basis of recurring demand.

The Chief of Naval Material manages supply and fleet depot maintenance facilities, such as shipyards. He has delegated responsibility for supply policymaking to the Naval Supply Systems Command and for program execution of ship depot maintenance to the Naval Sea Systems Command (NAVSEA). NAVSEA sets operating policy and performance standards for naval shipyards to use in planning and executing overhauls and in managing materials. NAVSEA also is responsible for seeing that these policies and standards are implemented.

Within naval shipyards, the planning department determines which materials should be ordered in advance for overhauls. Several months before an overhaul starts, planners in the department examine the work package and decide which materials should be ordered. They use several information sources during this process, including ship plans, technical repair standards, and allowance parts lists. Collectively, these documents are used to identify all materials that may be ordered, including mandatory replacement parts and contingency parts. Planners generally base requirements for contingency material on their judgment and experience or on records of what was ordered, but not necessarily used, for earlier overhauls.

NAVSEA has provided shipyards an automated management information system to help manage depot maintenance work. Subsystems designed to assist material management activities include a material management subsystem and a material requirements planning subsystem. The material management subsystem collects historical material usage information while the material requirements planning subsystem analyzes this information and provides it to planners.

PRIOR REPORT

We reported on the need for more efficient material management practices at naval shipyards in a March 1978 report entitled "Naval Shipyards--Better Definition of Mobilization Requirements and Improved Peacetime Operations are Needed" (LCD-77-450, Mar. 31, 1978). The report cited weaknesses in shipyard procedures in (1) determining material requirements and (2) performing inventories.

We reported that inadequate planning of material requirements led to high material costs. Therefore, we recommended that the Navy implement procedures to ensure past material usage experience is adequately considered when material requirements are planned for future work. The Navy agreed and said corrective measures would be implemented. The Navy stated that:

> "In 1974, work began on development of an automated Material Requirements (MR) application as a part of the shipyard management information system. The first phase of the application which provides Allowance Parts List information has been completed and is operational. The second phase which provides planners and estimators with historical material usage information will be ready for implementation in January 1978."

Our 1978 report also stated that shipyards needed to better identify excess materials and perform physical inventories to improve the accuracy of records. The Navy responded that inventory problems we had identified at Puget Sound and Norfolk would be corrected but that the conditions at those shipyards were not representative of all naval shipyards.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our principal objective was to evaluate material management at naval shipyards. Specifically, we reviewed shipyard systems for establishing material requirements, monitoring material usage, and controlling excess materials. We performed the review because of increases in inventory levels, and because many production supervisors attributed reduced efficiency to material problems, as reported during our review of labor resource management at naval shipyards. (GAO/NSIAD-84-96, Apr. 24, 1984.)

Between November 1983 and October 1984, we worked primarily at NAVSEA headquarters and at the Mare Island and Norfolk Naval Shipyards. Mare Island was selected because it was one of two shipyards that reportedly had implemented the material requirements planning subsystem. Norfolk was selected because it was one of the larger naval shipyards and because it had not implemented the planning subsystem. Also, we visited the Charleston Naval Shipyard because it had developed a new material management

system and the Long Beach Naval Shipyard because it reportedly had accumulated a significant amount of material that was not recorded on official inventory records. Therefore, in total, we visited four of the eight naval shipyards. At each location we obtained data and interviewed shipyard officials.

We could not statistically analyze material problems at naval shipyards because they did not have reliable information on material usage, shortages, and surpluses. For example, shipyards have accumulated large amounts of materials that are not recorded on official inventory records and have not conducted required physical inventories. As a result, our conclusions are based on analyses of material management procedures and practices and judgmental samples. Where documentation was available, we developed examples and discussed them with shipyard officials. In addition, we took into account our prior reviews and related work performed by the Naval Audit Service.

We also visited Ingalls Shipbuilding Division of Litton Industries in Pascagoula, Mississippi, and the Seattle Division of Todd Pacific Shipyards Corporation in Seattle, Washington, to discuss how the private sector manages materials. These shipyards were selected on the basis of discussions with NAVSEA officials.

We made our review in accordance with generally accepted government auditing standards.

CHAPTER 2

REQUIREMENTS DETERMINATION PROCESS FOR DIRECT MATERIALS CAN BE MORE EFFECTIVE

The naval shipyards do not effectively determine direct material requirements for future overhauls. The principal reasons for this condition are that (1) historical usage information on prior overhauls is not analyzed and (2) complete and accurate usage data is not collected. Although we could not estimate exactly how much could be saved by an effective requirements determination system, our review showed that material shortages and surpluses continue to reduce efficiency and increase costs of shipyard depot maintenance.

Analysis of historical usage information would help shipyards avoid material shortages and surpluses that have occurred during prior overhauls. In 1978, NAVSEA instructed shipyards to establish data banks and collect information on past material usage. About the same time, NAVSEA provided the shipyards an improved material requirements planning subsystem so that shipyard planners would be able to analyze historical information during the requirements determination process. However, NAVSEA was unsuccessful in getting the shipyards to implement the data analysis portion of the subsystem. Instead, the shipyards have continued to use local systems that have proven to be ineffective in determining material requirements.

Effective material requirements planning also requires the collection of complete and accurate usage information. NAVSEA and private shipyard officials believe that accurate information on materials used during prior overhauls is extremely valuable in planning material requirements for future work. This information is not being obtained. Although information is collected on materials issued for overhauls, information on materials actually used in the overhauls is not accumulated. Historical usage records also do not include information on many items manufactured by the shipyards and installed on the ships during overhaul. As a result, planners do not have a proper base for analyzing historical data.

The lack of actual usage information has, in our opinion, contributed to the accumulation of large quantities of unused materials in shipyard shops. Some of these materials are not recorded in official inventory records. If recorded, managers would be in a position to assign needed materials to currently planned overhauls or return them to the supply system and, therefore, avoid the cost of ordering and purchasing similar materials.

HISTORICAL USAGE PHASE NOT IMPLEMENTED

According to NAVSEA, one phase of the material requirements planning subsystem was intended to provide the shipyards with the capability to analyze materials actually used during prior overhauls. If fully implemented, the subsystem was to give planners ready access to detailed information on (1) materials issued and used for each overhaul and (2) materials used to repair specific components during all recent overhauls. Analysis of the information would permit planners to enhance efficiency and productivity by ordering needed materials for future overhauls of the same class of ships. Material shortages that presented problems during earlier overhauls could be identified and the procurement of unneeded materials could be minimized.

The shipyards we visited have not implemented the historical usage analysis portion of the material requirements planning subsystem. Discussions with shipyard data processing and planning officials indicated the subsystem was too cumbersome and did not support local procedures. Instead of adopting the NAVSEA subsystem, they continued to develop local systems. Norfolk and Mare Island planners also said the subsystem had not been fully implemented because the usage information it provided would be inaccurate.

NAVSEA has been aware that shipyards have not implemented the subsystem since at least 1980 when it wrote to the shipyards that:

> "Audits conducted at various naval shipyards have indicated significant direct material inventory excesses exist. One of the findings stated that 40 percent of all direct material ordered, or about $9 million annually is not used. The primary reason is post overhaul material analysis of History Usage is not performed." (Emphasis added.)

NAVSEA is reconsidering whether the subsystem should be implemented, modified, or replaced.

ANALYSIS OF USAGE HISTORY COULD PREVENT SOME MATERIAL PROBLEMS

Norfolk and Mare Island planners have not analyzed information on materials actually used during prior overhauls. Analyzing this information would enable them to minimize recurring material shortages and surpluses and would help reduce the amount of material that must be ordered after an overhaul begins. The large amounts of materials ordered by the production department after overhauls start illustrate the inadequacy of material planning. At our request, Norfolk's electronics shop analyzed materials that had been ordered for four ships after overhauls had started and found that the production department had ordered about 64 percent of the 3,345 line items ultimately used.

The electronics shop provided us a few requisitions it had submitted to request materials for similar radar work on two overhauls. We identified a digital indicator, a motor assembly, and a radio-frequency oscillator that the planning department had not ordered in advance for either overhaul. The requisition for the digital indicator was marked "urgent" and "work stoppage," which indicates delivery had to be expedited. Shop foremen stated that planners should have been able to predict the need for these and other items on the basis of past experience.

Analysis of historical usage data would also enable shipyard planners to minimize material surpluses. We identified numerous examples of surplus materials that could have been prevented by such analysis. The following cases illustrate where Mare Island planners should have considered past usage in identifying material needs.

--Two to seven springs (NSN 5360-00-862-4967), costing about $300 each, were ordered and received by the shipyard to repair hatches and doors on four successive overhauls. The mechanic doing the work said he had never had to replace this particular spring. The shop recently returned 21 of them to supply.

--Three to four filters (NSN 4330-01-052-1294), costing $50 each, were ordered to repair the high pressure air systems on three successive overhauls. According to the technical repair standard and the mechanic doing the work, this is a mandatory replacement item but only one filter is needed. The shop had accumulated 22 filters in unrecorded stockpiles.

--Four to eight rotary relays (NSN 5945-01-051-3905), costing $120 each, were ordered to repair the control circuit on an air dryer system on four successive overhauls. The technical repair standard identifies two relays as contingency items. The mechanic who repaired the system the last four years said he had never had to replace the relay. The shop returned 12 of them to the supply system.

Although better planning would reduce material problems at naval shipyards, some material shortages and surpluses cannot be avoided. For example, some shortages are caused by the addition of work after an overhaul starts and some surpluses are caused by canceled work. We could not determine the extent to which material shortages and surpluses could be reduced by analysis of usage history because shipyards do not collect needed information.

MATERIAL PROBLEMS REDUCE EFFICIENCY AND INCREASE LABOR COSTS

Recurring shortages reduce efficiency and increase labor costs because (1) production personnel must be diverted from their primary duties to spend time on such activities as rescheduling work and searching for materials and (2) supply personnel must spend time expediting the acquisition of needed materials. Recurring surpluses also increase costs because time and funds are spent to order, store, and dispose of unneeded materials.

The efficiency of production department personnel at Mare Island and Norfolk was decreased by recurring material shortages. In some shops, foremen spent much of their time obtaining needed materials, while in other shops, mechanics were assigned material duties. At Mare Island, for example, one mechanic estimated that 350 of the 1,400 labor-hours he spent overhauling high pressure air condensers could have been eliminated if the planning department had ordered all materials needed for the overhauls. Various documents showed that the planning department had not ordered identical valves, pressure gauges, wearing rings, and parts kits in advance for three successive ship overhauls. The mechanic said the extra time had been needed to identify unordered materials, prepare the necessary documents, and reschedule work around material shortages.

Recurring material shortages also increased the amount of time supply personnel at Mare Island and Norfolk spent expediting the delivery of needed materials. For example, at the time of our review, Norfolk's supply department was involved in extensive expediting efforts to alleviate material shortages, as shown in the following table:

Organization	Persons involved in expediting	Time spent expediting
	(number)	(percent)
Receipt control	40	90
Stock management	6	75
Purchasing	13	60
Shop stores	6	50
Technical	13	5

Recurring material surpluses also increase shipyard costs because funds are spent to purchase, store, and dispose of unneeded materials. While no specific standard has been set for measuring shipyard performance in this area, private shipyard and naval shipyard officials stated the amount of unused materials should not exceed 5 to 10 percent of the materials ordered. NAVSEA proposed a goal of 15 percent for unused materials in response to a recent Naval Audit Service report. According to shipyard financial and operating statements, several shipyards

exceeded these goals for overhauls completed between January 1982 and March 1984. Had the level been reduced, the amount of unused materials would have been reduced by $117.3 million at the 5-percent level and $42.6 million at the 15-percent level as follows:

Shipyard	Value of material		Potential unused material reductions			
			5-percent goal		15-percent goal	
	Received	Unused[a]	Unused	Reduction	Unused	Reduction
	(millions)					
Portsmouth	$ 67.3	$ 29.9	$ 3.4	$ 26.5	$ 10.1	$19.8
Long Beach	99.4	14.4[b]	5.0	9.4	14.9	-
Charleston	93.8	21.1	4.7	16.4	14.1	7.0
Pearl Harbor	82.8	14.7	4.1	10.6	12.4	2.3
Puget Sound	218.5	31.9	10.9	21.0	32.8	-
Norfolk	133.9	33.6	6.7	26.9	20.1	13.5
Mare Island	116.5	7.9	5.8	2.1	17.5	-
Philadelphia	177.7	13.3	8.9	4.4	26.7	-
Total	$989.9	$166.8	$49.5	$117.3	$148.6	$42.6

[a]In some instances, the amount of unused material reported was understated because it was taken from shipyard reports prepared during the overhauls. These reports did not include unused materials which were turned in after the reports were issued. NAVSEA officials noted that amounts reported also included some duplicate items because materials not used on one overhaul could be transferred to a future overhaul and still not be used.

[b]Includes $7 million in unused materials for the U.S.S. New Jersey. Long Beach had reported $307,000 in its financial statement, but the Navy Auditor General stated excess materials were worth $7 million.

MATERIAL USAGE INFORMATION IS NOT ACCURATE

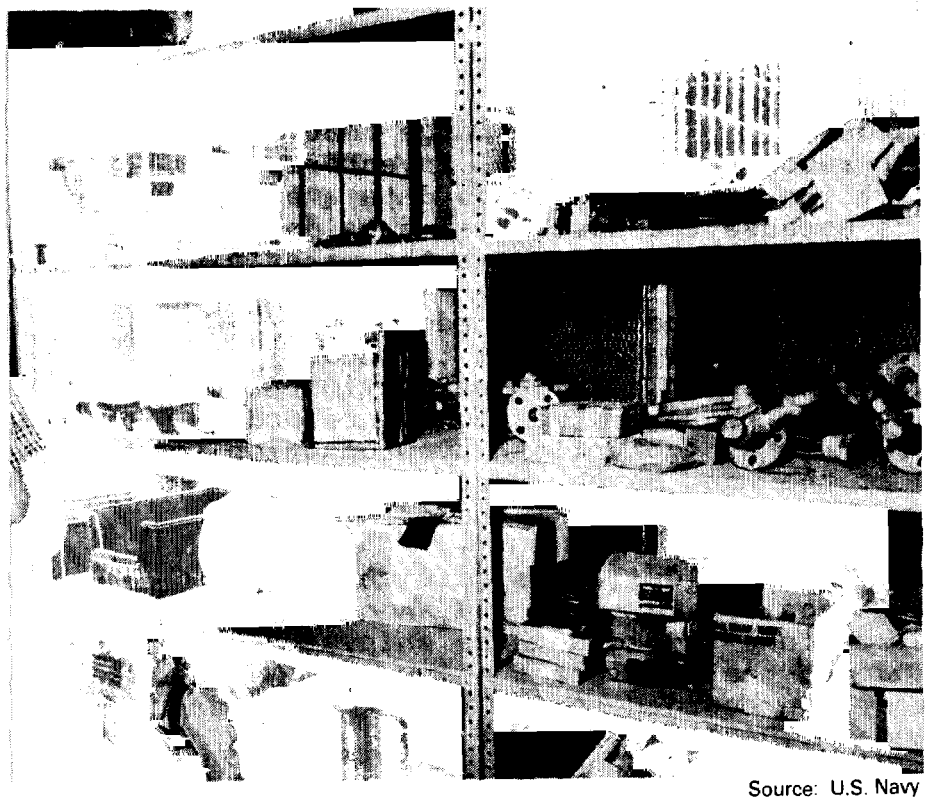
Historical usage information collected by shipyards is inaccurate because it (1) includes unused materials that were placed in unrecorded stockpiles instead of being returned to the appropriate inventory location and (2) does not include many items used during an overhaul that were manufactured by a shipyard.

Historical usage information includes unused materials

Shipyards have accumulated large amounts of unused materials that are not recorded in official inventories. Unrecorded materials distort the historical usage data available for analysis by the planners because the historical data does not reflect the unused materials but instead shows the materials as issued.

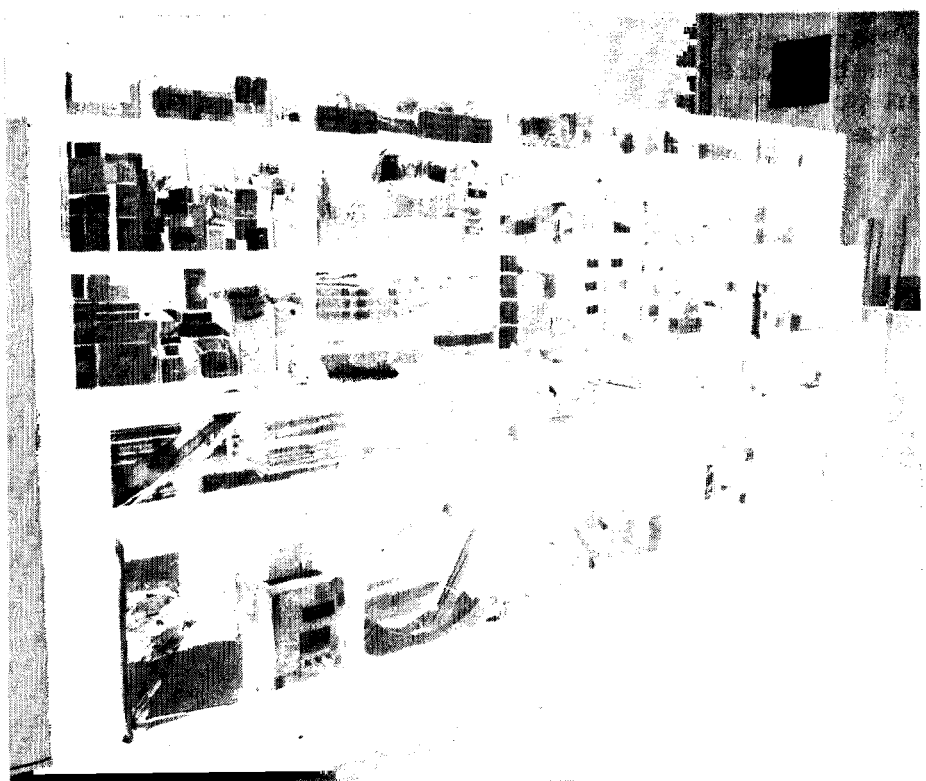
Since 1968, Navy policy has required that all unused materials be recorded in official inventories. This policy was reiterated by NAVSEA in a 1979 instruction and in a 1980 letter to the shipyards. However, we found unrecorded materials, commonly referred to as "goldpiles" by production workers, were widespread at the Long Beach, Norfolk, and Mare Island Naval Shipyards.

The extent of goldpiles is difficult to determine because individual mechanics, foremen, and shop planners keep them at dispersed locations throughout the shipyards. In December 1983, a study group at the Long Beach shipyard estimated the volume of the shipyard's unrecorded assets to be 3,500 measurement tons, equal to about 140,000 cubic feet of material. In June 1984, Long Beach supply department officials estimated the value of unrecorded materials to be far in excess of $14 million. At the time our fieldwork was completed the shipyard had actions under way to record these materials. At Mare Island and Norfolk, production personnel also showed us extensive stockpiles of unrecorded materials but they did not indicate that action was being taken to record these materials. The photographs on the next page are examples of such materials.



Source: U.S. Navy

UNRECORDED MATERIALS AT A MARE ISLAND MACHINE SHOP



Source: U.S. Navy

UNRECORDED MATERIALS AT NORFOLK'S ELECTRONICS SHOP

Production personnel said they maintained large quantities of unrecorded materials so they would have ready access to the parts needed to do their work. They added that such stockpiles compensated for (1) parts that did not arrive in time for work to be carried out as scheduled, (2) wrong parts ordered by planners, and (3) material requirements identified after the ships arrive.

To illustrate problems with unused materials, we reviewed items typically ordered by Mare Island planners to repair air dehydrators, including desiccant (a drying substance), relays, filters, thermometers, and heaters. We examined documents reflecting the use and disposition of desiccant and found that, for each ship being overhauled, the production shop routinely received five to six barrels, although this type of drying substance was never used for their work. The desiccant accumulated in the shop's unrecorded stockpiles until March 1984 when 19 barrels, costing a total of about $2,750, were returned to supply. However, historical records were not revised, and the desiccant was still recorded as issued and therefore presumed to be used in the overhaul of the ships. Planners indicated that in such cases, even if they analyzed issue information, the unneeded materials might be ordered again because it would appear that the shop was using the material.

Since 1981, NAVSEA has required shipyard comptrollers to inspect production areas to prevent accumulation of unrecorded materials. However, inspections had not been made at three of the four shipyards we visited because, according to shipyard officials, this task was given a low priority.

Historical information does not include manufactured materials

Historical usage records are also inaccurate because they often do not include items the shipyards manufacture and install on a ship during an overhaul. Shipyards manufacture materials needed during an overhaul for various reasons. Some materials are manufactured because they are no longer available from the private sector or from the supply system. Others are manufactured because they cannot be obtained in time to meet production deadlines. Many of these items were not recorded in the historical usage data base.

Because manufactured materials were not recorded, precise statistics on the number of such items were not available. At our request, Mare Island's machine shop reviewed production control documents and found the shop had manufactured 3,500 to 4,200 items for other shops during a recent submarine overhaul. Our review of these documents showed that the shop also had manufactured about 3,000 additional items for its own use during the overhaul. None of these items were recorded in the historical usage data base.

Norfolk required shops to provide information on manufactured materials by sending reports to the planning department prior to the manufacture of the materials. However, a machine shop planning supervisor said about 60 percent of the reports were not sent to the planning department because the shop knew in advance that the materials could not be obtained in time from another source. Additionally, a planning official said the reports provided to the planning department were placed in storage and were not analyzed to determine whether additional items should be ordered in advance for future overhauls.

CONCLUSIONS

Planners are not being provided accurate information on materials used during prior overhauls. NAVSEA and private shipyard officials believe that such information is extremely valuable in planning material requirements for future work. Therefore, NAVSEA should take steps to require that shipyards collect accurate material usage information. The usage information collected now will be the historical information needed to plan for overhauls starting in 1986 and beyond. To ensure that accurate information is collected, shipyards should report all unused materials after each overhaul and all materials they manufacture. In addition, the shipyards should identify all existing unrecorded materials and properly record them.

Analysis of accurate historical usage information would help shipyards minimize material shortages and surpluses and reduce material, labor, and storage costs. NAVSEA is reconsidering whether the existing material requirements planning subsystem should be implemented, modified, or replaced. Because 6 years have already elapsed since NAVSEA provided shipyards the subsystem, the Navy should closely monitor this reconsideration process to ensure that a timely decision is reached in implementing an effective subsystem. While this process is going on, NAVSEA should develop an interim means for analyzing actual usage data when ordering materials for future overhauls. For example, shipyards could implement interim procedures to manually process appropriate documentation through their planning departments.

RECOMMENDATIONS

We recommend the Secretary of the Navy direct the Commander, NAVSEA, to:

--Initiate a one-time special project to have shipyards identify and record all existing unrecorded materials, and retain only those materials allowed by DOD and Navy regulations, return all other needed materials to the supply system, and dispose of materials that are no longer needed.

--Collect accurate information on materials used during overhauls. Properly account for unused materials upon the completion of each overhaul and record all manufactured materials in the historical usage data base.

--Adopt and implement a material requirements planning subsystem that the shipyards can use to analyze historical usage data.

--Ensure that shipyards, in the interim, implement procedures to analyze actual usage data when ordering materials for future overhauls.

AGENCY COMMENTS

On April 17, 1985, the Department of Defense (DOD) provided official written comments on a draft of this report. (See app. I.) DOD generally agreed with our recommendations.

In our draft report we proposed that the shipyards retain only those materials required for currently planned overhauls. DOD stated that the shipyards could retain additional materials up to that allowed by DOD retention policy. Since we did not intend that the shipyards have a more restrictive retention policy than other DOD activities, we have revised the recommendation accordingly.

DOD described some of the plans for implementing our recommendations. By June 1, 1985, NAVSEA will provide a plan to the Naval Material Command for a one-time special project to identify and record all existing unrecorded materials. The project will be designed not only to ensure that all materials are recorded but also to screen all nonstandard items to determine if they are actually standard stock.

The Navy is designing a material requirements subsystem, as part of a Shipyard Material Information Management System, to maintain requirements and asset information and to provide feedback information, including requirements determinations and materials ordered, issued, and used. The functional description and requirements statement is anticipated to be completed by the end of 1985.

Puget Sound Naval Shipyard is studying the feasibility of automatically extracting actual usage data from the existing material management system as an interim measure until the new Shipyard Material Information Management System is implemented. The feasibility study is expected to be completed by August 1985.

NAVSEA has a pilot program at Pearl Harbor Naval Shipyard to improve tracking of materials actually used in overhauls. This program is testing the feasibility of holding materials in control centers until they are actually needed for a job instead of issuing the materials well ahead of a job start, as is the current practice.

CHAPTER 3

MANAGEMENT OF SHOP STORES INVENTORIES CAN BE IMPROVED

In recent years, shipyard shop stores inventories and reported excess materials have increased substantially. According to financial reports, shop stores inventories increased from $177.3 million to $209 million, or 17.9 percent, between March 1982 and March 1984. During the same period, reported excess shop stores materials increased from $55 million to $77.4 million, or 41 percent. Several weaknesses in the management of these materials have prevented shipyards from minimizing inventory levels and related costs. Specifically, NAVSEA and the shipyards have not

--performed the required physical inventories necessary to ensure that shop stores records are accurate and

--effectively analyzed excess materials to determine if inventory levels are appropriate.

SHIPYARDS NEED TO PERIODICALLY INVENTORY SHOP STORES MATERIALS

A well-managed physical inventory program is essential for effective and efficient supply management. Accurate inventory records are critical for day-to-day decisions concerning which items to dispose of and which to stock. Inaccurate records could result in the purchase of unneeded materials if stock is on hand but is not recorded. Conversely, customer needs may not be satisfied if stock not on hand is shown on inventory records as available.

Since at least 1980, NAVSEA has required shipyards to inventory shop stores once a year. However, neither Norfolk nor Mare Island has performed the required annual physical inventories for many of its shop stores. Shipyard supply officials stated that they did not have sufficient personnel to perform the required inventories. This lack of verification has led to inaccurate records. According to the Naval Audit Service, a sample of 319 Norfolk shop stores items in 1984 disclosed that on-hand balances were inaccurate for 69 percent of the items sampled. At the time of our review, the shipyard was preparing a response to the Audit Service draft report.

Of Mare Island's 26 shop stores, 3 had not been inventoried since 1979, 8 since 1980, and 1 since 1981. As of August 1984, the most recent inventories at Mare Island had been completed in May 1983 when two shop stores were inventoried. The results of these inventories indicated that recorded on-hand balances were inaccurate for 82 percent of the items inventoried at one shop store and inaccurate for 91 percent of the items inventoried at

the other shop. During our review, we inventoried 53 items, valued at about $72,000, at three of Mare Island's shop stores and found that records for 38 items were inaccurate.

Several Mare Island studies indicated that inaccurate records have caused material shortages and have reduced the efficiency of production personnel. For example, during 1983 and 1984, dissatisfaction with the effectiveness of shop stores led production shops to document numerous instances where records indicated materials were on hand but, in fact, were out of stock. A planning department official investigating production personnel complaints in January 1984 noted that a wall-to-wall inventory to correct records was warranted. At the time our fieldwork was completed, inventories of all shop stores had been scheduled but not completed.

Inaccurate records can also result in increased costs. Materials were not automatically reordered when they should have been, and it took more time to manually reorder materials. Although Mare Island did not have data readily available on the total number of manual requisitions processed, we noted that 150 of 477 requisitions placed between April 12 and 25, 1984, were manually processed by supply personnel. Supply personnel said that processing orders manually required at least four times more work than processing automatic orders.

Costs at Mare Island were further increased because supply personnel manually reordered materials without first determining the economic and authorized order quantities. The economic order quantity is the amount of materials that minimizes the costs of preparing and processing requisitions (ordering costs) and the costs of storing the materials (holding costs). If too few items are ordered, ordering costs are excessive. Conversely, if too many items are ordered, holding costs are excessive. The authorized order quantity is the economic order quantity adjusted for such factors as amounts due from earlier requisitions.

We examined the 24 requisitions processed manually by Mare Island on May 21, 1984 (the most current data at the time of our review) and found that the quantities ordered exceeded the authorized order levels in 23 cases. The following are examples of materials ordered in excess quantities:

Item	Authorized order	Actual order	Excess order Quantity	Excess order Value
Paint	0	48	48	$3,049
Hydraulic fluid	0	72	72	1,384
Bearing	0	12	12	864

Authorized order quantities were zero because amounts due in from previous requisitions exceeded economic order quantities by 46, 59, and 24 units. While material obtained in excess quantities may be used eventually, inventory holding costs incurred for such materials are unnecessarily increased.

We asked NAVSEA officials about the shipyards' failure to perform required annual physical inventories. We were told that, in the future, shipyards would be required to report on the number of physical inventories taken to ensure that the NAVSEA guidance is followed.

SHIPYARDS NEED TO ANALYZE EXCESS SHOP STORES MATERIALS

Contrary to the guidance in the Navy's industrial fund manual, shipyards have neither identified, reviewed, nor returned unneeded shop stores materials to the Navy supply system. As a result, the level of excess materials has steadily increased and unnecessary inventory holding costs have been incurred. According to financial and operating statements, the value of shipyard excess shop stores materials increased from $55 million to $77.4 million, or 41 percent, between March 1982 and March 1984.

The reliability of these amounts is uncertain because required inventories have not been done and records are inaccurate. We inventoried 15 items on Mare Island's list of excess shop stores materials and found that excesses were overstated in 12 cases. For example, records indicated 38 bearings, costing a total of $2,400, were excess; however, our count and subsequent reconciliation of unposted issues and receipts showed the amount of excess was overstated by 27 items costing about $1,700.

Shipyard materials are very costly to order and hold. For example, a NAVSEA official estimated material holding costs at between 20 and 24 percent of their annual value. If this estimate is accurate and the value of the excess materials also is accurate, excess materials on hand in March 1984 would have cost the shipyards between $15.5 million and $18.6 million annually to hold. In addition, it is possible that some of the excess materials could be returned to the Navy supply system and used to fill requisitions from other locations, thus avoiding unnecessary procurement costs.

NAVSEA officials told us that they were reexamining the guidance to shipyards on excess materials. As part of the reexamination, NAVSEA will determine if more of these materials should be classified as long supply rather than excess and retained in inventory for future use.

CONCLUSIONS

The shipyards have not performed required physical inventories of shop stores or effectively analyzed excess materials. The NAVSEA actions to (1) implement new reporting requirements to ensure periodic inventories are performed and (2) reexamine the guidance on excess materials should improve the management of shop stores. However, NAVSEA must closely monitor the results of these actions to see that they are effectively carried out by the shipyards.

RECOMMENDATIONS

We recommend that the Secretary of the Navy direct the Commander, NAVSEA, to ensure that shipyards (1) perform the required physical inventories and (2) properly identify, analyze, and dispose of excess shop stores materials. Once NAVSEA has completed its actions in these areas, we recommend that the Secretary of the Navy direct the Commander, NAVSEA, to closely monitor the shipyards' implementation of any changes in guidance concerning physical inventories and excess materials.

AGENCY COMMENTS

DOD agreed with our recommendations. Mare Island Naval Shipyard is testing an inventory accuracy program which, if practicable, will be implemented at all shipyards on July 1, 1985. Also, the Navy is revising its retention level policy and all excess materials will be identified, analyzed, and disposed of in accordance with the revised policy. NAVSEA plans to monitor these actions.

CHAPTER 4

ORGANIZATIONAL GOALS AND INDIVIDUAL PERFORMANCE STANDARDS NEEDED FOR MATERIAL MANAGEMENT ACTIVITIES

The shipyards have not been held accountable for implementing systems and procedures to improve material management. The shipyards, in turn, have not held their personnel accountable for implementing prescribed procedures and for improving material management efficiency. As a result, problems cited in our 1978 report remain unresolved.

NAVSEA needs to set clear goals and collect accurate information for measuring how well shipyards manage materials. Once this is done, the shipyards should include appropriate standards in the performance appraisals of the shipyard employees responsible for material management activities and hold them accountable for meeting these standards.

ORGANIZATIONAL GOALS NEED TO ADDRESS MATERIAL PLANNING AND CONTROL

Performance measurement systems are valuable because they provide a way to measure an organization's efficiency and effectiveness. To be useful, such systems should include clear and measurable goals and accurate information on actual performance. NAVSEA annually develops a corporate management plan that identifies objectives and performance indicators for several areas, but material management is not one of them. Examples of the areas where NAVSEA has set goals include increasing the planned review of outdated specifications and standards by 15 percent and decreasing the technical manual revision backlog by 20 percent.

NAVSEA could establish similar goals for material management activities at shipyards. For example, goals could be established for the percentage of direct materials ordered after the start of each overhaul, the percentage of unused direct materials after each overhaul, and the percentage of excess shop stores inventories. Other Navy supply organizations have set similar goals. For example, the Naval Supply Systems Command has set a goal for retail stock fund managers to limit the amount of excess materials to 4 percent of total inventory.

NAVSEA has proposed a goal of 15 percent for unused direct materials but this goal has not been formalized by NAVSEA. Such a goal would not only give the individual shipyards a performance target but would provide a basis for comparing performance among shipyards. For example, from the table on page 8, NAVSEA could question why 44 percent of the material received at Portsmouth was unused whereas only 7 percent of the material received at Mare Island was unused, even though both organizations work primarily on nuclear submarines.

Once goals are established, NAVSEA could measure actual performance against these goals. A system already exists for NAVSEA to regularly obtain information on actual performance. Each quarter, shipyards submit financial and operating statements containing cost and performance data specified by NAVSEA. These reports contain information on such matters as inventory levels, unused direct materials, and excess shop stores materials. However, NAVSEA must correct the completeness and accuracy problems identified in chapters 2 and 3 in order to make meaningful comparisons with the goals.

EMPLOYEE APPRAISALS NEED REALISTIC AND MEASURABLE PERFORMANCE STANDARDS

Shipyards could use employee performance appraisal systems to help see that the organizational goals are achieved. To be effective, managers will need to ensure that performance expectations contain measurable standards and that personnel are held accountable for meeting them. Currently, shipyards either have not set realistic and measurable standards or, where set, have not held their personnel accountable for meeting them. The procedures for measuring the performance of material planners illustrate the appraisal systems in use. Planning personnel at the Charleston and Mare Island shipyards were assessed under the Navy's basic performance appraisal program. At Charleston, the standard for material planning was specific to measure performance, but planners were not held accountable for meeting it. Charleston planners were rated satisfactory if they:

> "Review work packages, historical data and technical documents in a timely manner. Prepares job material lists (for long lead time, contingency and mandatory material) using accepted work practices. * * * Orders 85% of the material required to complete all shipyard work on each job with a * * * [maximum] of 15% excess. Seldom needs to consult with supervision once assignments are made." (Emphasis added.)

Charleston reported that 22 percent of the materials it ordered over the more than 2 years ending in March 1984 had not been used. This was about 7 percent more than Charleston's goal for unused materials. According to the head of the job planning branch, no planners were rated less than satisfactory during those years. He said planners had not been penalized for unused materials because the real goal of the shipyard was to order all materials that might be needed during an overhaul.

On the other hand, the standard for shipyard planners at Mare Island appeared unmeasurable. Planners performed at a satisfactory level if they:

"Accomplished job requirements in full and complete manner as expected of a competent, qualified and experienced professional. Almost always completes assignments on schedule. Prioritizes programs and projects well. Requires only normal direction and guidance. Errors are few and seldom." (Emphasis added.)

Norfolk's planning department is developing standards for measuring the performance of its planning personnel. A planning department official said these standards would consider material usage and other factors in measuring individual performance. According to the official, standards will be based on historical rates of usage and excesses.

In addition to planning personnel, the performance appraisal system could be used to hold supply, production, and other material management personnel accountable for improving efficiency and record accuracy. For example, production department employees could be held accountable for promptly and properly turning in unused materials after work is completed. If such a requirement is incorporated in their performance expectations, and shipyards have effective inspections for unrecorded materials, inspection results could be used to determine the effectiveness of shipyard employees involved.

CONCLUSIONS

In the past, shipyard managers have not been held accountable for implementing material management systems and procedures developed by NAVSEA. We believe that effective organizational and employee performance measurement systems are needed to ensure improvements are implemented at the shipyards. To be effective, such systems must include clear and measurable goals, as well as accurate information on actual performance.

At the organizational level, NAVSEA could set goals for the shipyards and use shipyard financial reports to obtain the information needed to measure performance and identify problem areas. At the employee level, shipyards could use performance appraisal systems to hold planning, supply, and production personnel accountable for improving material management.

RECOMMENDATIONS

We recommend that the Secretary of the Navy direct the Commander, NAVSEA, to set organizational goals for each shipyard that address the efficiency and effectiveness of material management activities. After such goals are set and adequate experience is gained in using them, we recommend that the Secretary of the Navy direct the Commander, NAVSEA, to require that shipyards include appropriate standards in the performance appraisals of shipyard employees responsible for material management activities and hold them accountable for meeting the standards.

AGENCY COMMENTS

DOD agreed with our recommendations. NAVSEA currently has an organizational goal of having 100 percent of the materials on hand before the start of an overhaul and plans to establish other organizational goals consistent with this goal. Inventory accuracy goals will be established by July 1, 1985. Efficiency standards such as material availability, customer wait time, excess materials, and unused materials will be measured against the goals. Standards for individual performance appraisals will be established after the organizational goals are set and the completeness and accuracy problems are corrected.

APPENDIX I

THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D. C. 20301-4000

SR
MANPOWER,
INSTALLATIONS
AND LOGISTICS

17 APR 1985

Mr. Frank C. Conahan
Director, National Security
and International Affairs Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

This is in response to your draft audit report dated February 28, 1985, entitled, "The Navy Can Improve Material Management At Shipyards" (GAO Code No. 394004, OSD Case No. 6702).

Comments received from the Navy have been used in preparing the enclosed response which addresses the findings and recommendations contained in the draft report.

Sincerely,

Jerry L. Calhaun
Principal Deputy Assistant Secretary of Defense
(Manpower, Installations & Logistics)

Enclosure
As stated

GAO note: Page references have been changed to correspond to pages in the final report.

GAO DRAFT REPORT - DATED FEBRUARY 28, 1985
(GAO CODE NO. 394004) - OSD CASE NO. 6702

"THE NAVY CAN IMPROVE MATERIAL MANAGEMENT AT SHIPYARDS"

DEPARTMENT OF DEFENSE COMMENTS

* * * * * *

FINDINGS

FINDING A: Material Inventories Have Increased Sharply In Recent Years. GAO noted that between 1979 and 1983, the value of inventory at Naval shipyards, as reported by the Navy, increased from $250.8 million to $523.4 million--about a 63 percent increase when adjusted for inflation. GAO also noted that for accounting and management purposes, shipyards separate materials into two types of inventories: the direct material inventory, containing industrial type material set aside for a specific overhaul; and the shop stores inventory, containing commonly used materials and supplies such as paints, bearings, nuts and bolts, generally based on recurring demand. [See p. 1.]

DoD Response: Concur. This does not necessarily indicate a problem, however, because the complexity and value of ships being overhauled at Naval shipyards has also increased substantially during this period. The Department agrees that inventory investment increased between 1979 and 1983. Further analysis of inventory investments and inventory consumption values between 1979 and 1984 shows a relatively constant investment/consumption ratio. Consumption remained at about one and one half times the value of the total inventory investment in each of the years analyzed.

FINDING B: Naval Shipyards Could More Effectively Determine Direct Material Requirements. GAO found that although information is collected on materials issued for overhauls, information on materials actually used in the overhauls is not accumulated. GAO concluded that, as a result, planners do not have a proper base for analyzing historical data. GAO also concluded that NAVSEA should take steps to ensure the required collection of accurate material usage information and that shipyards should report all unused materials after each overhaul. Usage information collected now, GAO concluded, will be the historical information needed to plan for overhauls in 1986 and beyond. [See pp. 4 and 12.]

DoD Response: Concur. The Navy will be directed to include quantities of materials actually used in overhauls in the Shipyard Management Information System. Shipyards will be required to return to inventory all unused materials after each overhaul. This information will be used to offset projected requirements to improve the accuracy of forecasted material required for future overhauls.

FINDING C: Usage Information Collected By Shipyards Is Inaccurate. GAO found that actual usage information is inaccurate because it includes large quantities of unused material in shipyard shops. GAO also found that some of this material, commonly called "gold piles," is not recorded in official inventory records, which is contrary to Navy policy. Supply officials, according to GAO, estimated the value of this material at one shipyard to be in excess of $14 million. GAO also found that historical usage records often do not include information on many items manufactured by the shipyards and installed on the ships during overhaul. GAO concluded that recording material usage would allow managers to assign needed material to currently planned overhauls or return it to the supply system and avoid the cost of ordering and purchasing similar materials in the future. [See pp. i, 4, and 8 to 12.]

DoD Response: Concur. When quantities of unneeded material are ordered and then not used, feedback is required to update the estimates upon which Job Material Lists are built. Failure to order material needed but not on the material lists is also a problem. Required material must be on hand to prevent work stoppages. Projections of needed material will be determined from the usage reviews suggested and from periodic interviews with shop foremen to validate the data. In addition, the Shipyard Management Information System will be revised to include information on items manufactured by the shipyard and installed during overhaul. Shipyards will be directed to return material in excess of retention levels to the supply system so that the purchase of materials already available can be avoided.

FINDING D: Naval Sea Systems Command (NAVSEA) Provided Shipyards With an Improved Automated System For Requirements Planning, But Shipyards Did Not Implement It. GAO found that the Naval Sea Systems Command (NAVSEA), in responding to the 1978 GAO report (OSD Case 4743), had instructed the shipyards to establish data banks and collect information on past usage, and NAVSEA provided the shipyards with an automated information subsystem that would (1) collect historical material usage information and (2) provide material analysis for the planners. GAO also found, in the shipyards visited, that the analysis portion of the subsystem was

not implemented, and shipyards have continued to use local systems which have proven ineffective. Shipyard officials, according to GAO, said the subsystem was "too cumbersome" and did not support local requirements. NAVSEA, GAO also found, is aware that the subsystem was not implemented, and is reconsidering whether it should be implemented, modified, or replaced. Because 6 years have already elapsed since the shipyards were provided with the subsystem, GAO concluded that the Navy should closely monitor this reconsideration process to ensure a timely decision is reached in implementing an effective subsystem. GAO concluded further that NAVSEA should develop an interim means for analyzing actual usage data when ordering material for future overhauls. [See pp. 4, 5, and 12.]

DoD Response: Concur. The Department agrees with shipyard officials that the analysis subsystem is cumbersome and local systems used in its place do not support all local requirements. The Navy will monitor closely the development of the material requirements subsystem (addressed in the DoD response to recommendation 3) which will maintain the historical data necessary for material assets and requirements analysis. In the interim, NAVSEA is conducting a study at NSY Puget Sound to determine whether information from the current material management system and the local material requirements systems can be extracted for analyzing actual usage data until the new subsystems are on line.

FINDING E: More Effective Planning Would Reduce The Amount Of Unused Material From Prior Overhauls. While pointing out that better planning would reduce material problems of naval shipyards, GAO recognized that some material shortages and surpluses cannot be avoided. GAO was unable to statistically analyze the extent to which material shortages and surpluses could be reduced by the analysis of usage history because shipyards do not have reliable information on material usage shortages and surpluses. GAO noted, however, that private and naval shipyard officials have stated that the amount of unused material should not exceed 5 to 10 percent of the material ordered. In response to a recent Naval Audit Service report, GAO also noted that NAVSEA had proposed a 15 percent goal. For overhauls between January 1982 and March 1984, GAO concluded that if the shipyards had reduced the material overage to 15 percent, unused material would have been reduced by $42.6 million, and if the material overage had been reduced to 5 percent, unused material would have been reduced by $117.3 million. GAO also concluded that recurring shortages of material reduce efficiency and increase labor costs because production and supply personnel must be diverted from their primary duties, and recurring surpluses increase costs because time and funds are spent to order, store, and dispose of unneeded materials. [See pp. 2, 5, 7, and 12.]

DoD Response: Partially concur. The Department agrees with the finding with the following exception: setting a goal of a percentage of unused material is inappropriate. A percentage of unused material is useful, however, as a management indicator but should be evaluated considering the cost to hold and order material as well as potential costs incurred by not having the material. Not all of these costs are currently available for material requirements. The Navy's Shipyard Material Information Management System (see DoD response to recommendation 3) will provide information that can be used in making cost comparisons and setting management indicators.

FINDING F: Shipyards Need To Periodically Inventory Shop Stores Materials. GAO found that, at least since 1980, NAVSEA has required shipyards to inventory shop stores yearly. GAO also found, however, that neither Norfolk nor Mare Island has performed the required annual physical inventory for many of its shop stores. GAO noted that of Mare Island's 26 shop stores, 2 had not been inventoried since 1979, 8 since 1980, 1 since 1981 and as of August 1984, the most recent inventories were 2 shop stores in May 1983. Shipyard officials, according to GAO, cited insufficient personnel as the reason for not taking the inventories. GAO queried NAVSEA about the shipyard's failure to perform required inventories, and was told that, to ensure NAVSEA guidance is followed, shipyards would be required to report the number of inventories taken. GAO concluded that the new reporting requirements should improve the management of shop stores if closely monitored. [See pp. 14 to 17.]

DoD Response: Concur. See the response to recommendation 5.

FINDING G: Shipyard Shop Stores Inaccurate Inventory Records Cause Material Shortages And Inefficiencies. GAO found that the results of the latest two inventories of shop stores (May 1983) showed that recorded on-hand balances were inaccurate for 82 percent of the items inventoried in one shop, and 91 percent inaccurate for the other. GAO inventoried 53 items, valued at about $72,000 at 3 of Mare Island's shop stores, and found 38 items to be inaccurate. GAO noted that several Mare Island studies have indicated that inaccurate records have caused material shortages and reduced the efficiency of production personnel. GAO found that materials incorrectly recorded as in stock were, therefore, not automatically reordered when they should have been, and it took more time to manually reorder. In addition, GAO found Mare Island supply personnel manually reordering material without first determining the economic and authorized order quantities. GAO noted that at the time its field work was completed, inventories of all shop stores had been scheduled but not completed. [See pp. 14 to 16.]

DoD Response: Concur. See the Department's response to recommendation 5 for actions taken to improve inventory accuracy. In addition, supply personnel will be directed to adhere to policies and procedures requiring them to reorder material only in authorized order quantities.

FINDING H: Shipyards Need To Analyze Excess Shop Stores Materials. GAO found that, contrary to the guidance contained in the Navy's industrial fund manual, shipyards have neither identified, reviewed, nor turned-in unneeded shop stores material to the Navy supply system. GAO also found that according to financial reports, from March 1982 to March 1984, shop stores inventories increased from $177.3 million to $209.0 million (about 17.9 percent) with reported excess material increasing from $55.0 million to $77.4 million (about 41 percent). GAO also found, however, that the reliability of these amounts is uncertain because required inventories have not been done and records are inaccurate. (GAO inventoried 15 items on Mare Island's excess material list and found excesses were overstated in 12 cases.) Additionally, based on a NAVSEA official's estimate that material holding costs are 20 to 24 percent of their annual value, GAO estimated the excess materials on-hand in March 1984 would have cost the shipyards between $15.5 million and $18.6 million annually. GAO reported that NAVSEA officials said that the guidance to shipyards on excess material is being reexamined, to include a NAVSEA determination if more of this material should be classified as "long supply" and retained in inventory, rather than excessed. GAO concluded that NAVSEA is initiating actions which address the need to identify, analyze, and properly dispose of excess materials and, if properly implemented, the actions should help eliminate the weaknesses identified. [See pp. 16 and 17.]

DoD Response: Partially concur. Costs to the shipyards of excess materials should not be expressed strictly in terms of holding costs. Holding costs should be offset by costs incurred in disposing of excess materials and potential cost to reorder those materials if they are required in the future.

Excess material, at the time of the report, consisted of all material on hand above the requisitioning objective. Establishment of a retention level above the requisitioning objective at the consumer level within the constraints discussed in recommendation 5 will reduce the stated amount of excess.

FINDING I: Organizational Goals Need To Address Material Planning And Control. GAO found that NAVSEA does not identify management objectives and performance indicators for material management. GAO concluded that NAVSEA should establish such management goals and performance indicators; e.g., for the percentage of material ordered after the start of each overhaul, the percentage of unused direct material remaining after each

APPENDIX I

overhaul, and the percentage of excess shop stores inventories. GAO pointed out that such goal performance indicators could be used to compare performance among shipyards. GAO also concluded that the shipyard quarterly financial and operating statements which contain such actual performance information should be used to measure performance and identify problem areas. GAO further concluded, however, that the previously identified inventory and completeness problems need to be corrected before meaningful comparisons can be made. [See pp. 18 and 19.]

DoD Response: Partially concur. NAVSEA identifies the management objective of having 100 percent of material on board before the start of overhaul. Additional appropriate management objectives and performance indicators will be established as discussed in the response to finding E and recommendation 6. Management indicators that include quantities of excess or unused materials will be considered. Shipyard quarterly financial and operating statements will be used to help measure performance and identify problem areas.

FINDING J: Shipyards Have Not Been Held Accountable For Implementing Systems And Procedures Provided By NAVSEA. GAO found that, currently, shipyards either have not set realistic and measurable standards or, where set, have not held personnel accountable for meeting them. In addition, GAO found that the performance appraisal system could also be used to hold supply, production, and other material management personnel accountable for improving efficiency and record accuracy. GAO concluded that the shipyards have not been held accountable for implementing systems and procedures to improve material management, nor have shipyard personnel been held accountable for implementing prescribed procedures and for improving material management efficiency. As a result, GAO further concluded, problems cited in the 1978 report remain unresolved. [See pp. 18 to 20.]

DoD Response: Partially concur. Shipyards were not held accountable for implementing the system referred to in finding D. Shipyards were held accountable, however, for implementing the shipyard material management subsystem, which was not noted in the draft audit report. See also the response to recommendation 6.

APPENDIX I

RECOMMENDATIONS

RECOMMENDATION 1: GAO recommended that the Secretary of the Navy direct the Commander NAVSEA to initiate a one-time special project to have shipyards identify and record all existing unrecorded material, and retain only that material required for currently planned overhauls, return all other needed material to the supply system, and dispose of material that is no longer needed. [See p. 12.]

DoD Comments: Partially concur. The Department agrees that a one-time special project to identify and record all existing unrecorded material is needed. NAVSEA will provide a plan to NAVMAT for the project by 1 June 1985 that will address resource requirements and all the actions, findings, and recommendations included in the GAO report. It is estimated that the project will take from two to three years to complete. The project will be designed not only to ensure that all material is recorded but also to screen all nonstandard items thoroughly to determine if they are actually standard stock. The initiation of this project is contingent upon the establishment of consumer level retention policy.

Shipyards will be allowed to retain some material in excess of that required for currently planned overhauls; DoD retention policy allows the Navy to retain up to 48 months' worth of projected demand at the retail level. Shipyards will be directed to return material in excess of the consumer portion of this level to the supply system and disposal action, if appropriate, will be taken. Actions are also underway to ensure that material with a current fleet application is not turned in to disposal.

RECOMMENDATION 2: GAO recommended that the Secretary of the Navy direct the Commander, NAVSEA, to collect accurate information on materials used during overhauls, properly account for unused materials upon the completion of each overhaul, and record all manufactured materials in the historical usage data base. [See p. 13.]

DoD Comments: Concur. The Shipyard Management Information System currently collects accurate information on all material issued for use during overhauls. To improve tracking of material actually used, NAVSEA has a pilot program at NSY Pearl Harbor to test the feasibility of holding material in material control centers until it is actually needed for a job as opposed to issuing the material well ahead of the job start as is the current practice. The concept will be used at other yards if it proves successful. In addition, the establishment of consumer level retention levels will give shop personnel more confidence that needed material will actually be on hand when required,

encouraging turn-in of unused materials. NAVSEA is developing a plan to record manufactured material in the inventory accounts in order to capture usage information. This is part of the interim plan for recording and analyzing actual usage data discussed in recommendation 4.

RECOMMENDATION 3: GAO recommended that the Secretary of the Navy direct the Commander, NAVSEA, to adopt and implement a material requirements planning subsystem which the shipyards can use to analyze historical usage data. [See p. 13.]

DoD Comments: Concur. A material requirements subsystem is being designed as part of a Shipyard Material Information Management System (MIMS). The system will be designed to maintain requirements and asset information and to provide all necessary feedback information including requirements determination, material ordered, issued, and used. MIMS is one module, or subsystem, of a Shipyard Integrated Management System (IMS) which is under development and will be accommodated by fourth generation computer hardware and software being purchased by NAVSEA. It is anticipated that the first increment of new hardware and software will be delivered in mid-1986. An overall plan is currently under development which will determine the order of implementation of the various subsystems of shipyard IMS. Shipyard IMS will be implemented in all shipyards. It is anticipated that the functional description and requirements statement for MIMS will be completed by the end of 1985 and that the MIMS will be the first subsystem implemented.

RECOMMENDATION 4: GAO recommended that the Secretary of the Navy direct the Commander, NAVSEA, to ensure that shipyards, in the interim, implement procedures to analyze actual usage data when ordering materials for future overhauls. [See p. 13.]

DoD Comments: Concur. Recent changes to the current shipyard MIS Material Management system have provided the capability to identify the equipment to which a repair part applies. This will allow use of historic usage data to identify requirements for repair parts for future overhaul of equipment. Puget Sound Naval Shipyard is currently tasked to determine the feasibility of automatically extracting actual usage data from the material management system as an interim measure until implementation of the MIMS. Upon completion of the lead shipyard effort, NAVSEA will evaluate the feasibility of implementation in all shipyards. This automated interim fix is being investigated in lieu of the GAO suggestion to process the appropriate documentation manually, which would be manpower intensive and costly. NAVSEA anticipates completion of the feasibility study of interim procedures at Puget Sound by August 1985.

RECOMMENDATION 5: GAO recommended that the Secretary of the Navy direct the Commander, NAVSEA, to ensure that shipyards (1) perform the required physical inventories and (2) properly identify, analyze, and dispose of excess shop stores material. GAO also recommended that the Secretary of the Navy, once NAVSEA has completed its actions in these areas, direct the Commander, NAVSEA, to closely monitor the shipyards' implementation of any changes in guidance concerning physical inventories and excess materials. [See p. 17.]

DoD Comments: Concur. NAVSEA obtained NAVSUP's assistance to review inventory accuracy at Naval Shipyards. As a result, an inventory accuracy program is being tested at Mare Island Naval Shipyard. Review of the test program will be conducted in early May with potential implementation of an inventory accuracy program at all shipyards on 1 July 1985. Monitoring of the program changes will be conducted quarterly.

Retail retention level policies have been revised from allowing 30 months to allow retention of a maximum of 48 months of projected demand. Navy retention level policy for the consumer portion of the retail level is currently being revised. All shop stores in excess of the consumer portion of the retail retention level will be identified, analyzed, and disposed of in accordance with the revised policy, and NAVSEA will monitor compliance.

RECOMMENDATION 6: GAO recommended that the Secretary of the Navy direct the Commander, NAVSEA, to set organizational goals for each shipyard which address the efficiency and effectiveness of material management activities. GAO also recommended that the Secretary of the Navy, after such goals are set and adequate experience is gained in using them, direct the Commander, NAVSEA to require that shipyards include appropriate standards in the performance appraisals of those shipyard employees responsible for material management activities, and hold these personnel accountable for meeting the standards. [See p. 20.]

DoD Comments: Concur. Current NAVSEA policy establishes an organizational goal of having 100% of material on board before start of overhaul. Other organizational goals consistent with this policy will also be established. Inventory accuracy goals will be established by 1 July 1985. Efficiency standards such as material availability, customer wait time, quantities of excess, and unused material will be measured against goals established in the design of the Shipyard Integrated Management System. Appropriate standards for individual performance appraisals will be established when these goals are set and the completeness and accuracy problems identified in Chapters 2 and 3 are corrected in order to make meaningful comparisons with the goals.

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