United States General Accounting Office

GAO

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

July 1994

NAVY SUPPLY

Improved Material Management Can Reduce Shipyard Costs

GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-257242

July 27, 1994

The Honorable Earl Hutto
Chairman, Subcommittee on Readiness
Committee on Armed Services
House of Representatives

Dear Mr. Chairman:

This report addresses material management practices at the naval shipyards. We found that the shipyards' material requirements determination process was not working as intended. As a result, shipyards ordered more material than was needed to accomplish ship repairs and the shipyards had unused material after repairs were completed.

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

Please contact me at (202) 512-5140 if you have any questions. The major contributors to this report are listed in appendix II.

Sincerely yours,

Mark E. Gebicke

Mark E. Gebicke
Director, Military Operations
and Capabilities Issues

Executive Summary

Purpose

The Navy's public shipyards support peacetime fleet maintenance needs and provide a base for responding to wartime requirements. Although the eventual size of the public shipyard industrial base is uncertain because of fleet downsizing, each shipyard should operate as efficiently as possible. Because the shipyards spend hundreds of millions of dollars annually on ship repair material and maintain substantial inventories, GAO evaluated the Navy's methods for managing and controlling shipyard material costs.

Background

The Navy's eight public shipyards employed about 50,000 civilians and incurred costs of about $4 billion in fiscal year 1993. About $416 million, or 10 percent of these costs, paid for material and supplies used to accomplish ship repairs. As Defense Business Operations Fund activities, shipyards recover material costs through prices charged customers for repair work, and shipyard customers use annual appropriations to pay for the work provided by the shipyards.

Most direct material requirements for ship repairs are identified by shipyard engineers and planners, and material is obtained from the Department of Defense (DOD) wholesale supply system or from commercial vendors. Other commonly used material items, such as nuts, bolts, and work gloves, normally are stocked in shipyard shop stores and are issued to production personnel on an as-needed basis.

To help control costs, Navy policy requires managers to limit direct material orders and shop store issues to the minimum required to complete ship repairs. Unused material from excessive orders often is not needed elsewhere and must be written off as a financial loss. Also, inventory control policies require excess shop store inventories to be minimized and prohibit accumulation of unrecorded inventories of material that are issued for ship repairs but are not used.

Results in Brief

Shipyard material management has improved since GAO last reviewed the subject in 1985. However, further improvements are possible. The shipyards' material requirements determination process still is not working as intended. As a result, shipyards ordered more material than was needed to accomplish ship repairs and the shipyards had unused material after repairs were completed. The quantity of unused material exceeded the Navy goal and resulted in waste when it had to be written off as a loss because it was not needed elsewhere. In fiscal years 1991 through 1993, the shipyards wrote off $88 million in losses for unused material,

including $56 million in material sent to disposal. Excessive material orders were caused by several factors, including the lack of analysis into the reasons for unused material and the absence of historical material usage data to help in determining requirements.

Also, because adequate management controls were not in place, the shipyards maintained inventories of material that were not recorded on official inventory records, issued more shop store material than was needed for some ship repairs, and did not ensure compliance with policies to eliminate excess shop store inventories and protect material assets from loss. As a result, inventory records were not accurate and material funds were wasted.

Principal Findings

Excessive Direct Material Orders Wasted Funds

The Navy's goal is to have no more than 5 percent of the direct material ordered for ship repairs unused after repairs are completed. However, in fiscal year 1993, the shipyards reported that unused material was 10 percent. The actual percentage of unused material was even greater than that reported because the reports excluded some unused material.

The shipyards wrote off $88 million in unused material in fiscal years 1991 through 1993 and held additional inventories of unused material that were awaiting disposition decisions. At the end of fiscal year 1993, the shipyards had $34.7 million of material on hand that had not been used on completed repairs and $11.8 million of material on order for repairs that were already completed. The cost of this material that cannot be used elsewhere will be written off and result in higher customer prices in future years.

Excessive material orders were caused by the lack of shipyard analysis into the reasons for unused material, the absence of historical material usage information to assist in the identification of material requirements, and questionable material ordering decisions. The Navy recognizes the need for historical material usage information and has a planned initiative to collect this data.

Shipyards Maintained Unrecorded Material

Although prohibited by Navy instructions and noted as a problem in prior audit reports, GAO tests at two shipyards found that the shipyards

continued to hold millions of dollars of material that was not recorded on official inventory records. For example, GAO identified almost 2,000 line items of material in two Norfolk shipyard shops that were not recorded on any official records. GAO reviewed a sample of 196 of these items to determine if DOD wholesale supply system managers were purchasing any of the items. GAO found that the managers had outstanding orders for 33, or 17 percent, of the items. The Navy could have saved $61,000 if the unrecorded inventory had been used to fill outstanding material orders for these items.

GAO identified similar problems at the Puget Sound shipyard. In January 1994, the shipyard initiated a special effort to identify and turn in all unrecorded material. One of the shipyard's shops, the electrical shop, turned in 21,000 parts valued at $336,000.

Unrecorded inventories cause additional waste when production shops use unrecorded material to satisfy repair requirements instead of the material ordered for the repairs. For example, Norfolk shipyard statistics showed that $1.3 million in material ordered for specific repairs between April 1992 and October 1993 was not used and became excess because the repairs were completed using unrecorded inventories.

Although the Navy had taken some steps to minimize unrecorded material, shipyard management had not performed periodic shop visits to search for unrecorded inventory. This step was effective at aircraft maintenance depots in helping prevent the accumulation of unrecorded material.

Inadequate Controls Over Shop Store Issues

The shipyards did not minimize shop store issues for ship repair material or for items with personal use value, such as flashlights, padlocks, and gloves. GAO tests found that production supervisors approved some material issues that were not needed or were in excessive quantities. For example, 500 square feet of aluminum plate, costing $7,600, was issued for a USS Nassau repair, although only 8 square feet was needed. Also, 120 pairs of work gloves, costing $580, were issued for a USS Ohio repair, although the shop receiving the gloves did not work on the repair.

Shop Store Inventories Exceed Requirements

Existing management controls did not always ensure shipyard compliance with Navy policies to eliminate excess inventories. For example, about $42 million, or 31 percent, of the shop store inventories at the eight shipyards was excess to current requirements at the end of fiscal year 1993

and should have been returned to the wholesale supply system or otherwise disposed of. Some of the excess items could have been used to fill outstanding supply system orders.

Material Is Not Adequately Protected

The Naval Sea Systems Command requires physical inventories of both shop stores and direct materials as a control to help safeguard material assets and ensure accurate inventory records. However, all required physical inventories were not performed. For example, the Norfolk shipyard conducted only one of five required direct materials inventories between January 1992 and August 1993.

Also, lost material was a problem. During a 2-month period in 1993, shops at the Norfolk shipyard filed 94 reports of lost material, and replacement material costing $63,000 had to be reordered. For example, 300 feet of cable costing $6,430 was issued to a shop for work on a USS Eisenhower repair and subsequently was lost. The shop report stated "need material to replace cable which cannot be located." During fiscal year 1993, the Puget Sound shipyard wrote off $203,000 in material losses after physical inventories could not locate the material.

Recommendations

GAO makes a number of recommendations to the Secretary of the Navy for improving material management in the naval shipyards. Included are recommendations to improve the accuracy of material orders and reduce unused material (see ch. 2); identify and return unrecorded material and help prevent future accumulation of unrecorded inventories (see ch. 3); and require improved controls to minimize shop store issues, reduce excess inventories, and safeguard material assets (see ch. 4).

Agency Comments

DOD agreed with GAO's findings and recommendations and stated that corrective actions are underway (see app. I). The Navy has directed the shipyards to identify and analyze the causes of unused material and provide this information to material planners for use in determining material requirements for future work. The Navy also plans to implement a system to collect historical material usage information. Further, the Navy has directed shipyard commanders to develop strategies to reinvigorate efforts to control and reduce unrecorded material. In addition, the Navy has established additional controls over shop store issues and has taken steps to reduce excess inventories, ensure compliance with physical inventory requirements, and examine the lost material problem.

Contents

Figures

Abbreviations

DOD	Department of Defense
GAO	General Accounting Office
NAVSEA	Naval Sea Systems Command
NSN	National Stock Number

Introduction

The Navy's eight naval shipyards provide depot-level logistics support to the fleet, including the repair, overhaul, and modernization of Navy ships. Operating under the Naval Sea Systems Command (NAVSEA), these large industrial activities are chartered to produce quality products in a timely and cost-effective manner. In fiscal year 1993, the shipyards employed about 50,000 civilians and incurred costs of about $4 billion. Because of defense downsizing, the Navy plans to close the Charleston, Mare Island, and Philadelphia shipyards over the next several years.

Naval shipyards are industrial fund activities included in the Defense Business Operations Fund. As such, shipyards use a businesslike buyer-seller approach to contract with their customers, normally NAVSEA or fleet commands, for work to be performed. Shipyards use working capital funds to finance the cost of goods and services, and customers use annual appropriations to pay the shipyards for work completed. Shipyard prices for ship repair work are established to cover all costs without incurring a profit or a loss.

Naval Shipyard Material Management

The cost of material and supplies used to accomplish ship repairs at the naval shipyards is significant. Table 1.1 shows that material costs accounted for $416 million, or about 10 percent, of the shipyards' total costs in fiscal year 1993.

Table 1.1: Fiscal Year 1993 Material Costs by Shipyard

Dollars in millions

Shipyard	Total costs	Material costs	Percent
Charleston	$422	$42	10
Long Beach	352	35	10
Mare Island	491	32	7
Norfolk	769	80	10
Pearl Harbor	388	34	9
Philadelphia	455	68	15
Portsmouth	400	31	8
Puget Sound	787	94	12
Total	**$4,064**	**$416**	**10**

NAVSEA provides material management policies and performance goals for the shipyards and also monitors shipyard policy execution and goal achievement. Within the shipyards, primary responsibility for material management is divided among planning, supply, and production functions.

Prior to the start of work, shipyard engineers and planners identify most material requirements for ship repairs based on the work to be completed, technical drawings, equipment manuals, and lists of previously ordered material if the work was performed before. The shipyard's supply department then orders, receives, and warehouses the material until it is issued to production personnel when requisitioned. Production personnel are responsible for using the material to accomplish the repairs, identifying additional material requirements after work begins, and returning any unused material to the supply department.

Most ship repair material, called direct material inventory, is ordered for specific repairs before work begins and is obtained either from the Department of Defense (DOD) wholesale supply system or commercial vendors. Other commonly used material, such as nuts and bolts, normally is stocked in shop stores that are managed by each shipyard's supply department. Most shop store items are obtained from the wholesale supply system and normally are ordered on the basis of recurring demand. Shop store material is issued to production personnel to accomplish repair work on an as-needed basis. The goal of the stores is to have parts available when needed while minimizing the financial investment in inventory.

Table 1.2 shows the shipyards' investment in material inventories at the end of fiscal year 1993. The "other" inventory category in the table includes material ordered in bulk for multiple repair jobs, unused material awaiting disposition, and material retained for anticipated future repair requirements.

Table 1.2: Shipyard Material Inventories as of September 30, 1993

Dollars in millions

Shipyard	Direct material	Shop stores	Other	Total
Charleston	$10.0	$25.6	$9.7	$45.3
Long Beach	8.3	7.7	0.3	16.3
Mare Island	8.9	20.2	5.9	35.0
Norfolk	14.6	18.7	7.3	40.6
Pearl Harbor	12.2	16.8	9.0	38.0
Philadelphia	22.2	27.7	12.8	62.7
Portsmouth	4.5	9.9	14.5	28.9
Puget Sound	22.2	56.4	16.8	95.4
Total	**$102.9**	**$183.0**	**$76.3**	**$362.2**

According to NAVSEA policy, unused direct material inventories that are no longer required and shop store inventories that are excess to requirements should be returned to the wholesale supply system for resale to other customers or sent to disposal. Depending on the supply system's need for the material, the shipyards may or may not receive credit for returns. If no credit is given, the shipyard must write off the cost of the returns as a financial loss. Also, if the supply system will not accept the unused or excess material, the material normally is sent to a disposal activity for sale as scrap and its cost is written off. Similar to other shipyard costs, costs of material write-offs are recovered through the prices charged customers for future repair work.

Objectives, Scope, and Methodology

Control of labor and material costs is fundamental to efficient shipyard operations. For this reason and because we recently issued a report on shipyard labor costs,[1] we evaluated the Navy's management of material costs in the naval shipyards. Specifically, our objectives were to (1) determine whether the material requirements determination process minimized waste caused by unused material; (2) assess shipyard compliance with Navy instructions prohibiting accumulation of unrecorded material; and (3) evaluate the adequacy of controls used to manage material issues, limit inventory levels, and safeguard material assets.

We interviewed Navy officials and examined pertinent documents at NAVSEA, Washington, D.C., and also obtained and reviewed financial and material statistics from all eight shipyards. We performed detailed audit work at the Norfolk Naval Shipyard, Portsmouth, Virginia, and the Puget Sound Naval Shipyard, Bremerton, Washington. These shipyards were selected because they were the largest naval shipyards on each coast.

To determine whether the material requirements determination process minimized waste caused by unused material, we (1) interviewed shipyard officials and examined pertinent policies and procedures, (2) analyzed data reflecting the extent of and disposition of unused material in relation to NAVSEA goals, and (3) explored reasons for unused material by reviewing available statistics and interviewing planners who had ordered material that was not used. We also reviewed prior audit reports that addressed causes of excessive material orders and examined NAVSEA initiatives designed to improve the accuracy of material orders.

[1]Navy Maintenance: Improved Labor Estimates Can Reduce Shipyard Costs (GAO/NSIAD-93-199, July 22, 1993).

To assess shipyard compliance with Navy instructions prohibiting accumulation of unrecorded material, we interviewed NAVSEA and shipyard officials to discuss the status of unrecorded material and factors contributing to the accumulation of unrecorded inventory. We also assessed shipyard efforts to ensure all inventories are properly recorded and reviewed documents recently prepared to dispose of previously unrecorded material in one shop at the Puget Sound shipyard. In addition, we performed tests at the two shipyards visited. In the tests, we visited two production shops at each shipyard and, with the assistance of shipyard personnel, searched for unrecorded material. We considered material unrecorded if it was in its original packaging, not required for any current repair job, in a ready-for-issue condition, and not on shipyard inventory records. For selected items, we determined whether inventory managers in the wholesale supply system had outstanding orders for the material.

To evaluate the adequacy of controls used to manage material issues, limit inventory levels, and safeguard material, we discussed management controls with headquarters and shipyard officials. We also (1) conducted tests to determine whether issues of shop store material were justified and reviewed issue quantities of items with personal use value such as flashlights, padlocks, and leather gloves; (2) reviewed shop store excess inventories in relation to NAVSEA goals and interviewed officials to determine the causes for excess inventory; (3) examined shipyard records to determine compliance with physical inventory requirements and conducted limited tests of physical inventory accuracy; and (4) analyzed reports of lost material and discussed this issue with shipyard officials.

In the tests to evaluate justifications for shop store issues, we judgmentally selected 16 Norfolk and 16 Puget Sound issues of ship repair material that were approved by production supervisors. We discussed each issue with the planner responsible for planning the repair, asked whether the material was required for the repair, and if so, whether the minimum quantity was issued. For selected issues questioned by the planners, we interviewed the production supervisors to obtain their views on the need for the issues. We also judgmentally selected a total of 26 additional shop store issues approved by production supervisors from both shipyards for items with personal use value. For these issues, we asked the same questions of the responsible planners and production supervisors.

We performed our review between July 1993 and May 1994 in accordance with generally accepted government auditing standards.

Excessive Material Orders Wasted Material Funds

The Navy's material requirements determination process has not minimized waste. The shipyards wasted material funds by ordering more material for ship repairs than was needed. The unused material often could not be returned to the supply system or to vendors for credit and, therefore, was written off as a loss. In fiscal years 1991 through 1993, the shipyards wrote off $88 million in losses for unused material, including $56 million for material sent to disposal.

NAVSEA's goal is to have no more than 5 percent of the direct material ordered for ship repairs unused after the repairs are completed. However, in fiscal year 1993, the shipyards reported that unused material was 10 percent of material orders. The actual percentage of unused material was even greater than that reported because the reports excluded some unused material. Causes of excessive material orders were the lack of analysis into the reasons for unused material, the absence of historical material usage information to assist in material planning, and questionable material ordering decisions.

Excessive material orders have been a long-standing shipyard problem that has been noted in prior audit reports. NAVSEA has new initiatives to address the problem. However, further steps are necessary to minimize accumulation of unused material.

Goal for Unused Material Has Not Been Met

Recognizing the need to keep material orders to a minimum, NAVSEA established a shipyard goal in 1988 to limit the amount of ship repair material that is ordered but not used. The goal was to have no more than 10 percent of the material ordered to be unused after the repairs were completed. The goal allowed for some unused material that results from unanticipated work changes and occasional errors in identifying, ordering, receiving, storing, and issuing material. Six shipyards met the goal in fiscal year 1992. As a result of that performance and in an effort to further reduce material costs, NAVSEA strengthened the goal to 5 percent in March 1993.

According to NAVSEA guidance since March 1993, shipyards should calculate the percentage of unused material by dividing the value of material unused at the time each repair task is completed by the value of material ordered for the task. This information can be accumulated for an entire ship overhaul and for an entire shipyard to compare actual performance with the goal.

The percentage of unused material reported by each shipyard in fiscal years 1992 and 1993 is shown in table 2.1.

Table 2.1: Reported Percentage of Unused Material

	Fiscal year	
Shipyard	**1992**	**1993**
Charleston	15	14
Long Beach	2	3
Mare Island	10	10
Norfolk	7	7
Pearl Harbor	6	3
Philadelphia	3	[a]
Portsmouth	2	3
Puget Sound	11	12
Combined	8	10

[a]Data not reported for fiscal year 1993.

As shown in the table, only three shipyards reported meeting the new NAVSEA goal in fiscal year 1993. The reported data also showed that unused material for all shipyards increased from 8 percent to 10 percent between fiscal years 1992 and 1993. NAVSEA officials attributed this increase to unanticipated workload changes in fiscal year 1993.

Unused Material Statistics Were Understated

According to NAVSEA and shipyard personnel, the unused material statistics reported in fiscal year 1993 were understated because the shipyards' automated material management information system was not designed to report unused material statistics at the time repair tasks were completed. Instead, the system reports the value of the current amount of unused material for an entire ship, which decreases over time as actions are taken to dispose of unused material. As a result, the actual amount of unused material was greater than that reported by the shipyards.

To illustrate, for the last quarter of fiscal year 1993, the Norfolk shipyard reported that unused material was 4.2 percent of material orders. However, this statistic reflected the current balance of unused material after much of the material had been reassigned to other ships, returned to the wholesale supply system, or sent to disposal. The statistic included current data from several completed overhauls. The USS America data showed $3 million of material orders and no unused material, and the

USS Nassau data showed $3.3 million of material orders and $21,000, or 0.6 percent, of unused material. We manually compiled data using the NAVSEA definition of material not used at the completion of each repair task and found that unused material actually was about 12 percent on the USS America and about 10 percent on the USS Nassau. We found similar examples at the Puget Sound shipyard.

NAVSEA has recognized the problem in reporting unused material statistics and directed the Charleston shipyard to design and test changes to the material management information system. NAVSEA officials stated that Charleston implemented the changes to its system and recently began reporting unused material performance in accordance with the NAVSEA definition. The officials further stated that the other shipyards plan to implement the system changes during fiscal year 1994, and as they do, the reported percentages of unused material probably will increase.

Excessive Material Orders Resulted in Waste

Ordering more material than needed for ship repairs wastes material funds and increases repair costs. In some cases, costs of excessive orders can be minimized when shipyard personnel use left over material for other repair jobs or when a shipyard returns the material to the wholesale supply system for credit so it can be used elsewhere.

However, in many cases the cost of unused material is wasted. For example, when the wholesale supply system takes back unused material but provides no credit because there is no immediate need for the material or when unused material is sent to disposal, the shipyard writes off the cost of the material as a financial loss. Because the costs of such write-offs are recovered through the prices that are established for future ship repair work, shipyard customers, and ultimately the taxpayer, must pay the costs associated with excessive material orders.

Table 2.2 shows that shipyard material write-offs totaled $88 million for fiscal years 1991 through 1993.

Table 2.2: Value of Material Write-Offs at All Shipyards

Dollars in millions

	Fiscal year			
	1991	1992	1993	Total
Returns with no credit	$21.3	$6.2	$4.4	$31.9
Material sent to disposal	21.0	14.5	20.4	55.9
Total write-offs	**$42.3**	**$20.7**	**$24.8**	**$87.8**

In addition to the above write-offs, the shipyards were holding millions of dollars in unused material that was awaiting final disposition decisions. At the end of fiscal year 1993, the shipyards held material inventories valued at $34.7 million that were awaiting disposition because they were not used on completed repairs. The shipyards also had material valued at $11.8 million that was still on order for repair jobs that were already completed. Shipyard officials told us that in many cases such orders could not be canceled or the material was received before the orders could be canceled. Although some of this material may be used on other jobs or returned for credit, shipyard officials stated that the cost of much of this material will be written off as a loss.

Several Factors Contributed to Excessive Orders

We identified four factors within shipyard control that contributed to excessive material orders. First, the shipyards did not routinely identify and analyze the causes for unused material so that corrective actions could be initiated. Second, material planners did not have historical material usage information available on previously performed repairs to provide a guide for future orders. Third, some material planners made questionable material ordering decisions. Fourth, production personnel used unrecorded material to complete repairs instead of the material ordered for the work. (See ch. 3.)

Other factors outside of shipyard control also contribute to excess material. Such factors include customer changes or cancellation of repair work after material is ordered and unanticipated changes in material specifications. We focused on those factors that were within the shipyards' ability to correct.

Shipyards Did Not Analyze the Causes of Unused Material

One step toward reducing unused material is identifying and analyzing the causes for excessive material orders. However, the two shipyards we visited did not routinely undertake this step. Only Norfolk made an effort to identify reasons for unused material on specific repairs. In most cases, this effort did not identify underlying causes of the problem or lead to development of strategies to reduce unused material.

To illustrate, Norfolk material analysts attempted to determine the reason material was not used on completed repair tasks. As part of this process, they asked the production shop supervisor responsible for the repair why the material was not used. The analysts then recorded the reason in a data base for possible future review.

Although this process was useful, it usually did not go far enough in determining the underlying causes of the problem. For example, we reviewed information developed on the USS Nassau in July 1993, a few weeks prior to completion of the overhaul. Norfolk's analysts had attempted to determine the reasons why 1,512 material line items costing about $712,000 were not used on completed USS Nassau work. The cited reason for 53 percent of the line items was that planners simply had ordered more material than was needed to complete the repairs. The analysts did not develop more detailed information on why the planners ordered more material than was needed, and further analysis of the causes for unused material was not performed.

At the Puget Sound shipyard, no analysis was performed to determine why material was ordered but not used. Thus, no statistics were available on the causes for excessive material orders. Officials at both shipyards agreed that such information would be helpful in developing strategies to reduce excessive orders.

Historical Material Usage Information Was Not Available

Another factor contributing to excessive material orders was the absence of material usage information on prior repairs. Although such information can provide a valuable guide to engineers and planners responsible for identifying material requirements for similar work, the shipyards did not collect and analyze actual material usage data on completed repairs. As a result, shipyard personnel ordered repair material on the basis of prior orders for similar work, even though some of the previously ordered material was not used.

To illustrate, we talked with one Norfolk planner who ordered $500 worth of insulation that was not used. A production shop had reported to material analysts that this material was ordered every time a certain repair was performed, even though the material was never used. However, the planner did not receive this feedback. The planner stated that he did not know that the material was never used and had based the order on previous orders for the repair.

We interviewed five Norfolk and four Puget Sound planners who had ordered material that was not used. Each planner stated that more detailed material usage information would improve the quality of the material requirements determination process and would reduce excessive material orders.

The need for collection and analysis of material usage information has been noted in prior audit reports. For example, in our 1985 report on shipyard material management,[1] we recommended that NAVSEA collect accurate information on material used during overhauls and implement procedures to analyze actual usage data when ordering material for future overhauls. Although NAVSEA agreed with the recommendations, a system to provide actual usage information was never implemented. NAVSEA officials stated that lack of resources had precluded development and implementation of a material usage system. However, the officials also stated that as part of an ongoing NAVSEA improvement initiative, the Advanced Industrial Management program, a material usage feature is being developed. NAVSEA plans to have an initial capability for this feature at all shipyards by the end of 1994.

Some Planners Made Questionable Material Ordering Decisions

An additional factor hindering accurate material orders was the tendency of some planners to order material known to be of questionable need at the time it was ordered. Material ordering guidance for contingency material, that material which may or may not be required depending on a component's condition, normally requires supervisory approval. However, for lower cost items, planners may order contingency material based on their knowledge and experience. In some instances, we found that planner decisions to order contingency material were questionable.

For example, a Norfolk planner ordered five valves costing $3,500 that were not used and became excess. The planner stated that the valves were contingency parts that he ordered simply because they might be needed to complete the repair.

At Puget Sound, contingency material was ordered on four of six jobs we reviewed. Planners stated that they ordered more material than was required just in case it might be needed. For example, one planner ordered three seals costing a total of $1,200, even though the job only required two seals. The planner stated that he ordered the extra seal as a contingency. In another case, a valve cap costing $878 was ordered, not used, and became excess. The planner said that he should not have ordered the part since it was not required to complete the repair. One planner stated that it was routine practice at Puget Sound to order extra material for contingency purposes.

[1]The Navy Can Improve Material Management at Naval Shipyards (GAO/NSIAD-85-71, May 6, 1985).

Conclusions

Excessive material ordering is a long-standing problem that will require a shipyard culture change to correct. Past practices of ordering more material than was needed attempted to ensure that production schedules were never affected by material shortages. However, such practices did not adequately consider the substantial waste associated with unused material. In view of today's limited budgets, a balance between production requirements and the cost of excessive material orders must be achieved.

By establishing a goal to limit unused material, NAVSEA has begun to change shipyard practices by focusing on the cost of unused material. Also, NAVSEA's new initiative to implement a system to collect historical material usage data is another step toward improving material requirement determinations. However, additional steps are needed to minimize the unused material costs and achieve needed change. These steps include analyzing the causes of unused material and ensuring that shipyard planners have adequate justification for contingency material orders.

Recommendations

We recommend that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to

- require that each shipyard identify and analyze the causes of unused material as a step toward developing strategies to improve the accuracy of material orders,
- ensure that the planned system to collect historical material usage information is successfully implemented, and
- direct shipyard planners to order contingency material only when there is a sound basis for doing so.

Agency Comments

DOD agreed with our findings and recommendations and stated that corrective actions are underway. NAVSEA has directed the shipyards to identify and analyze the causes of unused material and provide this information to material planners for use in determining material requirements for future work. Also, a system to collect historical material usage information will be implemented at the five shipyards not scheduled for closure. Further, NAVSEA has directed shipyard commanders to ensure that all orders for contingency material are adequately justified.

Shipyards Continue to Maintain Unrecorded Material

Although prohibited by Navy instructions and noted as a problem in prior audit reports, unrecorded material continues to be a problem in the shipyards. Our review found millions of dollars of ready-for-issue material that was not shown on any inventory records.

Unrecorded inventory weakened inventory management, compromised internal controls, and resulted in waste when production shops used unrecorded material to satisfy repair requirements instead of the material ordered for the repairs. Additional waste resulted when inventory managers for the wholesale supply system bought new material to meet requirements that could have been satisfied with unrecorded material.

More aggressive action would help to ensure that shipyard personnel comply with instructions requiring the return of all unused material so that inventories of unrecorded material do not accumulate.

Instructions Prohibit Unrecorded Material

Unrecorded material, commonly referred to as "goldpiles" by shipyard personnel, is defined as any material that is not recorded on inventory records. Normally, material is controlled on inventory records until it is issued to production personnel for use on a particular repair. Once issued, the material is deleted from the inventory records and the cost is charged against the particular repair job for accounting purposes. Navy instructions require the return of any issued material that is not used so that the material can be added back on the inventory records and an accounting adjustment can be made to the cost of the repair.

Unrecorded material results when production personnel do not return unused parts but instead retain the material in the shop area for possible future use. No official records are maintained on this material, which is usually stored on shelves or in lockers, cabinets, or closets in the shop area.

Except for pre-expended bin material and work-in-process material, Navy instructions prohibit the accumulation of unrecorded material for several reasons. First, because unrecorded material is not visible to inventory managers, these managers could purchase additional material to meet needs that could be satisfied with the unrecorded inventory. Second, because official, written records do not exist, controls to protect unrecorded material from unintentional loss, obsolescence, or theft are not in place. Third, unrecorded material can cause waste when it is used to satisfy ship repair requirements instead of the material specifically

ordered for the repairs. Fourth, the existence and use of unrecorded material hinder efforts to collect accurate material usage data for use in future ordering. Finally, unrecorded material distorts cost accounting data because the repairs charged with the material did not use the material and no cost accounting transactions were recorded when the material was used to complete other repair jobs.

Shipyards Have Large Unrecorded Inventories

In our 1985 report, we reported that the shipyards maintained extensive quantities of unrecorded material. We recommended that the Navy initiate a one-time special project to have shipyards identify and record all goldpile material. The Navy agreed and stated that the project would begin by June 1, 1985, and would be completed in 2 to 3 years.

Although the project was undertaken and large amounts of material were identified and added back on inventory records, little was done to prevent the problem from recurring. During our current review, we found that the Norfolk and Puget Sound shipyards still had significant quantities of unrecorded material. NAVSEA officials stated that even though they regularly emphasize the need to reduce unrecorded inventories, goldpiles exist to some degree at all shipyards.

Goldpiles at the Norfolk Shipyard

Norfolk material analysts collected data that showed goldpile inventories were a problem at the shipyard. Between April 1992 and October 1993, material costing about $1.3 million was ordered for specific repairs but was not used because production shops completed the repairs with goldpile material. For example, as of July 1993, the USS Nassau had 1,512 line items of unused material on completed ship repair work. For 27 percent of the line items, use of goldpile material to satisfy the repair requirement was cited as the reason that the ordered material was not used. In most cases, the unused material subsequently became excess and the shipyard initiated disposal actions.

To illustrate, a Norfolk planner ordered a nickel copper plate for a ship alteration on the USS Nassau. However, the $5,936 plate was not used in completing the job. The responsible production shop reported that, rather than using the ordered plate, the shop used a plate from its goldpile. The plate that was supposed to be used in the ship alteration subsequently became excess and the shipyard initiated disposal action.

In October 1993, we visited four work centers in Norfolk's electrical and electronics shops to look for goldpile material. We saw extensive quantities of goldpile material stored in shop production areas. In two of the work centers, the supervisors kept a computerized listing of their goldpile material. Results of our visits to the four work centers are summarized below.

In the electronics shop's fire control work center, the computerized goldpile list included 1,080 line items of standard material (stocked by the wholesale supply system) and 290 line items of nonstandard material. We judgmentally selected 65 of the standard material line items and determined that the cost of the items was over $134,000.

In the electronics shop's search radar work center, the computerized goldpile list included 509 line items of standard material and 72 line items of nonstandard material. We judgmentally selected 65 of the standard material line items and determined that the cost of the items was about $174,000.

In the electronics shop's communications work center, the supervisor did not keep a list of goldpile material. However, we observed about 15 large cabinets containing goldpile material. In about 20 minutes we recorded the stock numbers for 28 items and counted the on-hand quantities. The cost of this material was over $29,000.

In the electrical shop's plug work center, the supervisor said that he maintained an extensive quantity of goldpile material but did not keep a listing of the material. The supervisor showed us one storeroom, primarily containing electrical connectors, and stated that the room contained goldpile material valued at about $4 million. In about 20 minutes we recorded the stock numbers for 38 items and counted the on-hand quantities. The value of this material was over $33,000.

Figure 3.1 shows storage bins filled with goldpile material in the fire control work center, and figure 3.2 shows the storeroom filled with goldpile material in the plug work center.

Norfolk shipyard officials stated that they recognize goldpiles are a problem and that they had chartered a team to analyze and propose solutions to the problem. At the time of our visit, the team had not completed its study.

Figure 3.1: Unrecorded Material in Norfolk's Fire Control Work Center

Figure 3.2: Unrecorded Material in Norfolk's Plug Work Center

Goldpiles at the Puget Sound Shipyard

The Puget Sound shipyard did not collect information on the causes of unused material, therefore, data were not readily available to show whether goldpile inventories contributed to unused material. However, shipyard officials and shop supervisors told us that unrecorded material is a problem at the shipyard.

Immediately prior to our visit to Puget Sound, the shipyard initiated a special effort to identify and turn in all goldpile material. Although the effort was still underway during our visit in February 1994, the electrical shop had documented most of its goldpile material for turn-in. The documents identified 154 different stock numbers and over 21,000 individual parts that had been in the shop's goldpile. The value of this unrecorded material was about $336,000. Some of the items in the shop's goldpile were 50 selector switches valued at $16,900, 120 indicator lights valued at $16,600, 26 circuit breakers valued at $15,200, and a power transfer switch valued at $7,800.

We visited several work centers in the electrical and electronics shops to determine if the shops were complying with the shipyard initiative to turn in all goldpile material. In the electronics shop, all unrecorded material that we saw was already segregated in an area awaiting preparation of turn-in documents. Similarly, in the electrical shop, we saw unrecorded material in areas awaiting turn-in.

However, we also found goldpile material in the electrical shop that had not been identified for turn-in. In the circuit breaker work center, we found material still in its original packaging that was stored in several shop area cabinets and drawers. In about 15 minutes we recorded 23 different stock numbers for 69 parts valued at over $20,600.

Some Unrecorded Items Are Being Purchased

We reviewed records maintained by inventory managers for the wholesale supply system to determine if they were purchasing material that was available from goldpiles at the Norfolk and Puget Sound shipyards. We found that the supply system had outstanding orders for many of the items and that use of the goldpile material could have reduced these purchases.

We checked 196 line items from the 4 work centers visited at the Norfolk shipyard and found outstanding orders for 33, or 17 percent, of the items. Using the goldpile material to help satisfy requirements could have reduced the purchases by about $61,000. For example, the supply system had outstanding orders for two circuit card assemblies (NSN 7050-00-172-5885), while Norfolk's fire control work center had six of these assemblies costing $7,980. Similarly, the supply system had outstanding orders for 8 tachometer motors (NSN 6105-00-689-7799), while Norfolk's communication work center had 13 of these motors costing $5,486.

At the Puget Sound shipyard, we checked the 154 line items recently turned in from the electrical shop's goldpile and found outstanding orders for 9, or 6 percent, of the items. If goldpile material had been used to help meet requirements in these cases, purchases could have been reduced by $12,800. We also checked the 23 goldpile items we found in the electrical shop that had not been turned in and identified outstanding orders for 6, or 26 percent, of the items. Using the existing goldpile inventory to help satisfy requirements could have reduced the purchases by about $5,800. For example, the supply system had outstanding orders for six toggle switches (NSN 5930-00-969-2477), while Puget Sound's electrical shop had nine of these switches costing $3,558.

Factors Contributing to Unrecorded Material

Although instructions prohibiting goldpiles are clear, Norfolk and Puget Sound officials stated that use of goldpiles had been a common practice in many work centers. Work center supervisors believe it is necessary to maintain goldpiles in order to meet production schedules. In their opinion, the supply system is not always responsive and the use of goldpile material often is the only way to meet production requirements in a timely manner.

NAVSEA officials stated that many shipyard personnel do not perceive that any benefits result from the turn-in of unrecorded material. The shipyard personnel feel that since the material has already been paid for and turn-in might not result in a credit from the wholesale supply system, it is better to keep the material in the shop.

Because of these perceptions, NAVSEA officials recognize that management attention is needed to prevent the accumulation of goldpiles. As one method to do this, NAVSEA instructions require that shipyard managers make periodic visits to production areas to search for unrecorded material. However, we found that neither the Norfolk nor Puget Sound shipyards had instructions requiring such visits, and officials at both shipyards stated that spot checks for unrecorded material rarely occurred.

In a previous review of material management at the Naval Aviation Depots,[1] we found significantly less unrecorded material at depots where commanding officers had given personal attention to the problem by making unannounced shop visits to search for such material. Although the visits were limited, shop personnel at the depots stated that the top management visits had made a significant impression. They told us that, because of the attention, they tried much harder to ensure that all unused material was turned in properly.

Conclusions

Unrecorded material weakens inventory management, compromises internal controls, and results in waste when unrecorded material could have reduced material purchases or caused material ordered for ship repairs to go unused. NAVSEA has taken steps to minimize unrecorded material through instructions and discussions. In addition, the Norfolk and Puget Sound shipyards were taking some steps to address the goldpiles. Yet, unrecorded material continues to be a problem.

A key step in preventing the accumulation of goldpile material is consistent management attention, including periodic shop visits by top

[1]Navy Supply: Excess Inventory Held at the Naval Aviation Depots (GAO/NSIAD-92-216, July 22, 1992).

management to search for unrecorded material. The shipyards have not performed this step on a regular basis. As demonstrated at other maintenance depots, top management involvement at each shipyard should offer significant potential for convincing production personnel to turn in unused material.

Recommendations

We recommend that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to

- direct each shipyard to identify and record all existing unrecorded materials, retain only those materials that have a specific shipyard requirement, return all other needed materials to the supply system, and dispose of materials no longer needed and
- direct that top management at each shipyard make periodic spot checks for unrecorded material to help prevent the future accumulation of unrecorded inventories.

Agency Comments

DOD agreed with our findings and recommendations and stated that corrective actions are underway. DOD stated that NAVSEA has directed shipyard commanders to develop strategies to reinvigorate efforts to control and reduce unrecorded material. In an April 1994 letter to the shipyards, NAVSEA stated that material remaining after job completion must be returned to the shipyard supply department. In addition, NAVSEA has directed shipyard commanders to publish local instructions requiring that management personnel make periodic checks of production areas to identify and turn in unrecorded material. NAVSEA plans to review compliance with the periodic check requirement during future command inspections.

Controls Over Material Issues and Inventories Are Not Adequate

The shipyards did not minimize shop store issues of ship repair material or items with personal use value, such as flashlights, padlocks, and gloves. Production supervisors approved material issues that were not needed or were in excessive quantities for the repairs charged with the material. In addition, the shipyards did not comply with NAVSEA policies to eliminate excess shop store inventories and to protect material assets from loss. As a result, material funds were wasted and inventory records were inaccurate.

Improved management controls and attention are needed to correct these problems and achieve more effective and efficient material management in the shipyards. Better controls, such as improved accountability for shop store issues, can help ensure that shipyards minimize material costs. Improved management attention can help ensure that shipyards comply with existing policies to limit excess inventories and safeguard material assets.

Some Shop Store Issues Are Not Justified

Although most material used to accomplish ship repairs is ordered from the wholesale supply system or from vendors, a significant amount of material is obtained from shipyard shop stores. For example, for the refueling overhaul of the USS California completed in 1993, the Puget Sound shipyard issued $15.7 million in material obtained from the supply system or vendors and $8.5 million in material obtained from shop stores.

Shop store issues can be approved by shipyard production supervisors who are responsible for completing repair work but are not accountable for meeting ship repair material budgets. No additional approval or review is required from project managers or other officials accountable for material budgets. Without such controls, it is easier for production personnel to obtain more material than is necessary for a repair task.

Some Ship Repair Material Issues Were Not Required

We performed tests at the Norfolk and Puget Sound shipyards to determine if shop store issues approved by production supervisors were required for the repairs charged with the material. We selected shop store issues that were approved by production supervisors and discussed the need for the issues with the personnel responsible for planning the repairs. The results of our tests are shown in table 4.1.

Table 4.1: Selected Shop Store Issues Approved by Production Supervisors

	Number	Percent	Cost
Issues planner said were fully justified	9	28	$16,700
Issues planner said were required but were in excessive quantities	13	41	33,900[a]
Issues planner said were not required	8	25	33,300
Issues planner could not determine if fully justified	2	6	3,600
Total issues reviewed	**32**	**100**	**$87,500**

[a]The cost of the excessive quantity was $25,000.

The table shows that only 9 of the 32 shop store material issues were fully justified. In 21 cases, the planners stated that the material was not needed on the job charged with the material or that the material was needed but was issued in excessive quantities. In these cases, the planners stated that the extra material might have been used on other jobs or used to supplement shop goldpiles.

We subsequently followed up with the production supervisors to obtain their views on some of the material issues. The following examples illustrate the views of the planners and production supervisors.

A shop store at the Norfolk shipyard issued 500 square feet of aluminum plate costing $7,600 for a job to fabricate a tank on the USS Nassau. The planner stated that the tank was fabricated with carbon steel plate that had been issued for the job and that the aluminum plate was not needed. The production supervisor who approved the issue stated that he agreed with the planner, although the tank did require 8 square feet of aluminum for latch covers. He added that the rest of the aluminum plate probably was added to the shop's goldpile.

A shop store issued 2,108 feet of electrical cable costing $3,000 for a job involving cable installation on the USS Nassau. The planner stated that the job required armored cable, which was ordered and issued to the job. The 2,108 feet of cable issued by the shop store was not armored and was not required to perform the work. According to the production supervisor who approved the issue, nonarmored cable was needed for some work and an engineering change should have been issued for the work. However, the responsible design engineer stated that no engineering change had been issued because no nonarmored cable was needed for the job. Shipyard officials did not know the disposition of the cable.

A shop store at the Puget Sound shipyard issued 10 kits of epoxy paint costing $3,100 for a job requiring touch-up painting on the USS Ohio. The planner stated that only one kit was required and that nine kits costing $2,800 should not have been issued. The production supervisor who approved the issue agreed with the planner and stated that the extra material probably was used on other paint jobs or added to the shop's goldpile.

A shop store issued seven drums of chromium trioxide costing $1,000 for a USS Ohio job involving electroplating. The planner stated that only a portion of one drum was required to accomplish the work and that the balance of the issue was not justified. The production supervisor who approved the issue agreed with the planner. He stated that he was not familiar with electroplating work and had approved the quantity requested by the mechanic who performed the work. He added that the excess material probably was used on other USS Ohio jobs.

Material Issues With Personal Use Value Were Questionable

In addition to shop store material used directly for ship repairs, production supervisors approve shop store issues for indirect items such as flashlights, batteries, padlocks, and work gloves. As with direct material, adequate controls are needed to limit issues of such items to those essential for production work.

The shipyards issued large quantities of items with personal use value over the past 2 years. In some cases, the items were charged to shop overhead, and in other cases, the items were charged directly to ship repairs. Table 4.2 summarizes issues of selected items with personal use value for fiscal years 1992 and 1993.

Table 4.2: Selected Issues With Personal Use Value

	Norfolk shipyard		Puget Sound shipyard	
Item	Number	Cost	Number	Cost
Flashlights	15,500	$48,800	31,900	$60,900
D-cell batteries	140,500	72,300	120,300	64,000
Padlocks	15,800	50,300	34,900	221,400
Leather work gloves (pairs)	83,200	356,700	42,000	188,300
Cloth work gloves (pairs)	20,600	34,600	287,800	416,400

During this 2-year period, the Norfolk and Puget Sound shipyards each employed an average of about 7,000 production employees. Although the number of issues appears high, NAVSEA officials stated that the issues were

not unreasonable when viewed in terms of the number of issues per production employee. The officials further stated that significant differences in the nature of work among the shipyards affect the usage rates for such items.

To determine whether shop store issues of items with personal use value were required for the repairs charged with the material, we reviewed 26 issues approved by Norfolk and Puget Sound production supervisors. The planners for the jobs stated that only 3 of the 26 issues were fully justified. Of the remaining 23 issues, the planners stated that 10 issues were not required for the work charged with the material and that 13 issues were required but were in excessive quantities.

For example, 120 pairs of cloth and leather work gloves costing a total of $580 were issued and charged to a USS Ohio job involving the installation of lockers and furnishings. The planner responsible for this job stated that the issue was not justified because the shop that received the gloves did not perform any work on the job. The production supervisor who approved the issue agreed with the planner and stated that the gloves probably were used on other jobs.

In another case, 480 pairs of another type of leather work gloves costing a total of $760 were issued for a job involving the replacement of elevator cables on the USS Nassau. The planner stated that only 18 pairs of gloves were required to perform this work and, therefore, 462 pairs of gloves costing a total of $730 should not have been issued. The production supervisor who approved the shop store issue stated that the job required 370 pairs of gloves based on each assigned mechanic using 4 pairs of gloves each day. He stated that the extra 110 pairs of gloves probably were used on other jobs.

As a final example, 24 steel padlocks were issued and charged to a USS Ohio job involving the main seawater cooling pump. The planner said that the shop that received the padlocks did not perform any work on the job and that the issue was not justified. The production supervisor who approved the issue stated that someone else wrote his name on the issue document because he did not approve the issue. The mechanic who picked up the padlocks stated that he wrote the supervisor's name on the document after the supervisor gave a verbal approval. The mechanic also stated that the padlocks were needed around the shop and that the supervisor told him to charge the material to any open repair job number.

Shop Store Excess Inventories Exceed Goal

Shop store inventories contain large quantities of excess material. According to NAVSEA and shipyard officials, some shop store material becomes excess as a normal by-product of ship repair work. For example, excesses develop as a result of workload changes and forecasting and ordering errors. Excess inventories should be minimized because they tie up financial resources, add to storage and physical inventory costs, and result in waste if inventory managers buy material to meet requirements that could have been met if the excess material had been returned to the wholesale supply system.

Recognizing this, NAVSEA has established policies and goals for the management of shop store excess inventories. NAVSEA defines excess material as the quantity exceeding a predetermined amount plus 24 months of demand for an item. NAVSEA policies require shipyards to identify and return these excesses quarterly to the supply system for possible credit. NAVSEA also has established a goal that no more than 5 percent of each shipyard's shop stores inventory value should be excess. However, as table 4.3 shows, the shop store excess inventory at each shipyard exceeded the NAVSEA goal at the end of fiscal year 1993.

Table 4.3: Shop Store Excess Inventories at September 30, 1993

Dollars in millions

Shipyard	Inventory value[a]	Excess value	Percent excess
Charleston	$19.0	$7.3	38
Long Beach	7.3	1.4	19
Mare Island	13.1	2.0	15
Norfolk	12.3	2.2	18
Pearl Harbor	13.1	4.6	35
Philadelphia	21.6	9.5	44
Portsmouth	9.0	1.6	18
Puget Sound	39.8	13.4	34
Total	**$135.2**	**$42.0**	**31**

[a]The inventory value excludes $47.8 million in insurance inventories that are justified and retained on the basis of mission requirements rather than recurring demands.

Norfolk shipyard officials stated that one reason for the excesses was that the shipyard was not complying with NAVSEA's policy to review and remove excess material on a quarterly basis. Norfolk personnel had eliminated many shop store items that had no issues in 12 months or more, but had not eliminated excess quantities of items that had some issues as required

by NAVSEA criteria. They stated that this had not been done for the past 2 years because of personnel shortages.

Puget Sound shipyard officials stated that most of the excesses had been retained because, if eliminated, the material would be sent to disposal and written off as a loss. They stated that such write-offs would have a negative impact on the shipyard's financial statements.

In addition to tying up financial resources and adding to storage and physical inventory costs, excess inventories cause waste if inventory managers buy material to meet requirements that could have been satisfied with the excess material. At Norfolk, we judgmentally selected 37 of 1,775 stock numbers that had excess inventories and found that inventory managers had outstanding purchase contracts for 7, or 19 percent, of the line items. Using the shop store excess material to help satisfy these requirements would have reduced the purchases by about $31,400. At Puget Sound, we judgmentally selected 34 of the 5,167 stock numbers that had excess inventories and found that 1 item was being purchased by an inventory manager.

For example, the Norfolk shipyard had 13,954 feet of cable (NSN 6145-01-202-7772), costing $11,163, in the shop store inventory. On the basis of the monthly demand rates, this quantity would meet shipyard requirements for about 18 years. About 12,178 feet, or 87 percent, of the cable was excess to current shipyard needs. The inventory manager for this item in the wholesale supply system recently purchased 30,113 feet of this cable to meet other requirements. If the shop store excess material had been used to partially satisfy these requirements, about $9,700 would have been saved.

Similarly, the Puget Sound shipyard had 5,304 inches of metal bar stock (NSN 9530-01-049-7957L1), costing $35,500, in the shop store inventory. On the basis of the monthly demand rates, this quantity would meet shipyard requirements for 305 years. About 99 percent of this material was excess to current shipyard needs. The inventory manager for this item in the wholesale supply system recently purchased 264 inches of the material, at a cost of $1,766, to meet other requirements. This amount could have been saved if some of the shop store excess material had been used to meet these requirements.

Material Assets Are Not Adequately Protected From Loss

Internal controls, such as periodic physical inventories, material control procedures, and individual accountability, are needed to help ensure accurate inventory records and protection of material assets against waste or loss. We found that such controls at the Norfolk shipyard were not effective and, as a result, inventory records were inaccurate and funds were wasted because repair material was lost.

Physical Inventory Requirements Were Not Met

NAVSEA requires that each shipyard conduct physical inventories of both shop store and direct materials. The Puget Sound shipyard met the requirements. The Norfolk shipyard, however, met the requirement for shop stores but not for direct materials.

NAVSEA requires that physical inventories be taken of direct materials held for each ship overhaul scheduled to exceed 8 months or 50,000 labor days. Between January 1992 and August 1993, the Norfolk shipyard had five overhauls meeting this criteria. However, the required inventory was conducted for only one of the overhauls. NAVSEA also requires annual inventories of direct material held for unspecified future use. These annual inventories have not been performed at Norfolk since 1989. Norfolk shipyard officials stated that the inventories were not conducted because of staff shortages and problems with a computer program used to select inventory samples. The officials told us that the required inventories would be conducted in the future.

We made a limited test of the accuracy of Norfolk inventory records for direct material. We judgmentally selected 27 line items of material and compared the location and quantity on hand shown on the inventory records with the actual location and quantity on hand. We found that the location was incorrect for six, or 22 percent, of the items and the on-hand quantity was incorrect for four, or 15 percent, of the items. In each case where the inventory record showed an incorrect on-hand quantity, no material actually was on hand. According to the inventory records, the value of this material was $21,600. Shipyard officials believed that the material had been issued; however, they could not show evidence of actual disposition.

Lost Material Is a Problem

During our fieldwork, Norfolk shipyard officials stated that lost material was a problem and that several articles in the Norfolk shipyard newsletter discussed lost material, its impact on shipyard costs, and some steps the shipyard was taking to address the problem.

To assess the extent of lost material, Norfolk's inventory accuracy officer collected data on requests for replacement material during a 2-month period, from mid-April to mid-June 1993. The data were obtained from shop reports that asked planners to reorder material that had been issued to production shop personnel and subsequently was lost prior to use on a job. During the 2-month period, 94 reports of lost material were filed and replacement material costing $63,000 had to be ordered. The lost material had been issued for repairs to six different ships. The following are examples of the lost material.

- Three hundred feet of cable, costing $6,430, was issued to a shop for work on the USS Eisenhower and was subsequently lost. The shop report stated "need material to replace cable which cannot be located."
- Two cable assemblies, costing $1,100, had to be reordered for work on the USS South Carolina. The shop report stated that a box containing the assemblies had been removed and thrown away by another shop.
- A shop request asked planning to reorder two hydraulic cylinders, costing $1,300, for work on the USS Nassau. The original cylinders issued to the shop had been lost. The request for replacement parts stated "URGENT . . . Premium pay is authorized if it will [result in a] better delivery date . . . Please ship overnight air."

Norfolk's inventory accuracy officer believed that the lost material statistics during the 2-month period were representative of the normal amount of material lost at the shipyard. He stated that the primary causes of the lost material was lax enforcement of control procedures and a failure of management to hold individuals accountable for lost material.

Puget Sound shipyard officials stated that lost material was not a problem at the shipyard. However, they had not performed an analysis similar to that performed by Norfolk's inventory accuracy officer. Further, the Puget Sound shipyard wrote off $203,000 in lost material in fiscal year 1993 primarily as a result of physical inventories. In comparison, the Norfolk shipyard wrote off $164,000 in fiscal year 1993 as a result of physical inventories.

Conclusions

The shipyards did not ensure that shop store issues were required for the repairs charged with the material, issues of items with personal use value were minimized, excess shop store inventories were eliminated, required physical inventories were conducted, and material assets were protected from loss. As a result, material funds were wasted and inventory records

were inaccurate. Improved management controls and attention would help correct these problems and achieve more effective and efficient material management in the shipyards.

Recommendations

We recommend that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to

- require that project managers, or other officials accountable for material budgets, review shop store issues for ship repairs;
- establish additional controls over issues of items with personal use value;
- direct the shipyards to eliminate shop store excess inventories that exceed NAVSEA's retention criteria;
- ensure that shipyards comply with requirements for physical inventories of direct material; and
- determine the causes for lost material and develop strategies to reduce the losses.

Agency Comments

DOD agreed with our findings and recommendations and stated that corrective actions are underway. DOD stated that the project manager type of organization being implemented at the shipyards assigns singular responsibility to the project manager for meeting the material budget for a ship repair project. As a result, project managers will review shop store issues to ensure that charges to ship repairs are legitimate. In addition, NAVSEA has directed the shipyards to begin recording employee badge numbers for shop store issues so that possible abuses can be identified by reviewing unusually high quantities issued to an employee.

DOD stated that, subject to budgetary constraints, NAVSEA will gradually eliminate excess inventories through reduced replenishment quantities, normal consumption, and periodic write-offs. NAVSEA also will monitor compliance with physical inventory requirements at all shipyards and take corrective action where needed. In addition, NAVSEA plans to charter a process action team comprised of shipyard personnel to assess the magnitude of the lost material problem at the shipyards and provide analysis and recommendations.

Comments From the Department of Defense

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY

July 13, 1994

(L/MDM)

Mr. Frank C. Conahan
Assistant Comptroller General
National; Security and International
Affairs Division
U.S. General Accounting Office
Washington D.C. 20548

Dear Mr. Conahan,

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "NAVY SUPPLY: Improved Material Management Can Reduce Shipyard Costs," dated May 17, 1994 (GAO Code 703020, OSD Case 9656). The DoD concurs with the draft report.

As recognized by the GAO, shipyard material management has improved since the GAO last reviewed the subject in 1985. However, the DoD also agrees that there is room for improvement, and concurs with the draft report findings and recommendations.

The detailed DoD comments on the report findings and recommendations are provided in the enclosure. The DoD appreciates the opportunity to comment on the draft report.

Sincerely,

James R. Klugh
Deputy Under Secretary
of Defense (Logistics)

Enclosure

GAO DRAFT REPORT–DATED MAY 17, 1994
(GAO CODE 703020) OSD CASE 9656

"NAVY SUPPLY: IMPROVED MATERIAL MANAGEMENT CAN REDUCE SHIPYARD COSTS"

DEPARTMENT OF DEFENSE COMMENTS

*****

FINDINGS

Now on p. 2.

- o FINDING A: Navy Public Shipyards. The GAO reported that the eight public Navy shipyards employed about 50,000 civilians and incurred costs of about $4 billion in FY 1993. The GAO noted that about $416 million, or 10 percent of the total costs, paid for material and supplies used to accomplish ship repairs. The GAO explained that, as a Defense Business Operations Fund activity, shipyards recover material costs through prices charged customers for repair work, and shipyard customers use annual appropriations to pay for the work provided by the shipyards. (pp. 1-2/GAO Draft Report)

  DOD RESPONSE: Concur.

- o FINDING B: Navy Shipyard Material Management. The GAO found that the cost of material and supplies used to accomplish ship repairs at the naval shipyards is significant. The GAO noted that the Naval Sea Systems Command provides material management policies and performance goals for the shipyards and also monitors shipyard policy execution and goal achievement. The GAO pointed out that prior to the start of work, shipyard engineers and planners identify most material requirements for ship repairs based on (1) the work to be completed, (2) the technical drawings and equipment manuals, and (3) the lists of previously ordered material (if the work was performed before). The GAO explained that production personnel are responsible for the following:

  - using the material to accomplish the repairs;
  - identifying additional material requirements after work begins; and
  - returning any unused material to the supply department.

Enclosure
Page 1 of 18

Now on pp. 2 and 8-10.

The GAO stated that most ship repair material--i.e., direct material inventory--is ordered for specific repairs before work begins and is obtained either from the DoD wholesale supply system or commercial vendors. The GAO noted that other commonly used material, such as nuts and bolts, normally are stocked in shop stores managed by each shipyard supply department. The GAO pointed out that most shop store items are obtained from the wholesale supply system and normally are ordered on the basis of recurring demand.

The GAO found the Naval Sea Systems Command policy is that unused direct material inventories no longer required, and shop store inventories excess to requirements, should be returned to the wholesale supply system for resale to other customers or sent to disposal. The GAO pointed out that, depending on the supply system need for the material, the shipyards may or may not receive credit for returns. (pp. 1-2, pp. 11-13/GAO Draft Report)

DOD RESPONSE: Concur. The Navy has long recognized the importance of controlling materiel costs in order to perform repair work at the lowest possible cost to the customer. For that reason, the Naval Sea Systems Command is implementing a variety of initiatives to reduce naval shipyard inventories and material costs. As noted by the GAO, those initiatives have led to evident improvement in shipyard material management. The following information is provided in that regard:

- Since 1989, the total value of shipyard inventories has been reduced from $580 million to $302 million, a decrease of 48.4 percent. During that period, shipyard inventories declined at twice the rate of decline in workload.

- Since 1991, the cost of material used on shipyard repair work as a percentage of total cost of repairs declined from 17 percent to 12 percent. (Note: Those percentages are to be distinguished from the 10 percent statistic reported by the GAO under Finding A. The GAO compared total material cost to total overall shipyard cost. The statistics above compare direct material cost to total direct cost and provide a better indication of material performance. They serve as an established Naval Sea Systems Command performance indicator.)

- By establishing a material visibility system, the shipyards have redistributed excess material assets valued at nearly $4.0 million that would otherwise have been written off as a financial loss.

- Write-off costs associated with failure to return repairable carcasses to the supply system have decreased from an annual average of $6.0 million to nearly zero in 1993 and 1994.

Enclosure
Page 2 of 18

In addition, the Naval Sea Systems Command is now in the process of implementing the Advanced Industrial Management system, which re-engineers many of the processes followed by naval shipyards in performing repair work. Initiatives devised under the Advanced Industrial Management system hold significant potential for improving material management performance. The initiatives include improved work definition and repair instructions, compilation of material usage information to guide future material ordering, and enhanced material packaging and delivery to the job site.

The Naval Sea Systems Command will continue to pursue initiatives designed to reduce inventory investment and minimize material waste in naval shipyards.

- FINDING C: Goal for Unused Material Has Not Been Met. The GAO reported that, in 1988, the Naval Sea Systems Command established a shipyard goal--no more than 10 percent--to limit the amount of ship repair material ordered but not used. The GAO observed that six shipyards met the goal in FY 1992. The GAO pointed out that, as a result of that performance, and in an effort to further reduce material costs, the Naval Sea Systems Command strengthened the goal to 5 percent in March 1993.

  The GAO observed that, since March 1993, shipyards should calculate the percentage of unused material by dividing the value of material unused at the time each repair task is completed by the value of material ordered for the task. The GAO noted that only three shipyards reported meeting the new goal in FY 1993. In addition, the GAO pointed out that unused material for all shipyards increased from 8 percent to 10 percent between FY 1992 and FY 1993. The GAO further noted that, according to Command officials, the increase was attributable to unanticipated workload changes in FY 1993.

  The GAO also reported that, according to command and shipyard personnel, the unused material statistics reported in FY 1993 were understated because the shipyards automated material management information system was not designed to report unused material statistics at the time repair tasks are completed. As a result, the GAO concluded the actual amount of unused material was greater than that reported by the shipyards. The GAO indicated that the command had recognized the problem in reporting unused material statistics and directed the Charleston shipyard to design and test changes to the material management information system. The GAO pointed out that the Charleston shipyard had implemented changes to the system and the other shipyards planned to implement the system changes during FY 1994. The GAO noted that command officials expect the reported percentages of unused material probably will increase. (pp. 19-22/GAO Draft Report)

Now on pp. 13-15.

Enclosure
Page 3 of 18

DOD RESPONSE: Concur. In addition to establishing the more difficult 5 percent goal in 1993, the Naval Sea Systems Command changed the computational method so that excess material would be measured on a job-by-job basis, rather than aggregating excess for an entire availability. The Naval Sea Systems Command recognized that a 5 percent goal under the new computational guidelines was ambitious given the experience of shipyards to date, and fully expected that most shipyards would initially not meet the new goal.

Accordingly, the Naval Sea Systems Command has closely monitored performance in this area and has undertaken a variety of initiatives to reduce unused material performance. The most significant of those initiatives involves the roll out of a standardized material requirements system under the Advanced Industrial Management program. That system will provide material usage information to material planners so that the material experience from previous repair work may be considered during the ordering process. The Advanced Industrial Management system will also provide enhanced material planning documents in the form of "job summaries" and "task group instructions." Initial use of those documents on recent U.S.S. WASP and U.S.S. ROOSEVELT availabilities at the Norfolk Naval Shipyard resulted in unused material percentages of 4.2 percent and 4.6 percent respectively.

In addition, by letter dated May 24, 1994 to shipyard commanders, the Naval Sea Systems Command reiterated the need for judicious ordering of material that does not have a 100 percent probability of use on repair work ("contingency material"), directed that all outstanding orders be automatically canceled if the work for which the items were ordered has been completed, and required that excess material generation be added to the performance appraisal criteria for shipyard material planners.

It should be recognized, however, that regardless of the managerial attention applied and the quality of data collected, the forecasting of material needs prior to job start will continue to rely on the judgment and skill of material planners. As such, the process is imperfect. The planner must balance the need to avoid delay/disruption costs associated with material shortages at job start with the need to minimize the amount of material that is not used. Accordingly, the generation of material excesses at a rate under the 5 percent goal is considered exceptional performance.

As reported by the GAO, the Naval Sea Systems Command has recognized that unused material statistics may be understated and is implementing a revised computational method which more closely follows the policy established as part of the 5 percent goal. Under the new method, unused material performance will be calculated strictly on a job-by-job basis, with no credit given for shipyard success

Enclosure
Page 4 of 18

in redistributing material left over from one completed job to other authorized work. The change will provide greater management insight into material planner accuracy in forecasting discrete material requirements, but will overstate the amount of material that will actually go "unused" (and become waste) during the course of a ship availability.

- FINDING D: Excessive Material Orders Resulted in Waste. The GAO concluded that ordering more material than needed for ship repairs wastes material funds and increases repair costs. The GAO noted that, in some cases, the costs of excessive orders could be minimized when shipyard personnel use left over material for other repair jobs or when a shipyard returns the material to the wholesale supply system for credit so it can be used elsewhere. The GAO found, however, that in many cases the cost of unused material was being wasted. The GAO reported that shipyard material write-offs totaled $88 million for FY 1991 through FY 1993.

  The GAO found that the shipyards were holding millions of dollars in unused material that was awaiting final disposition decisions. The GAO reported that, at the end of FY 1993, the shipyards held material inventories valued at $34.7 million that were awaiting disposition because the material was not used on completed repairs. Furthermore, the GAO reported that the shipyards also had material valued at $11.8 million that was still on order for already completed repair jobs. The GAO acknowledged that some of the material might be used on other jobs or returned for credit; however, according to shipyard officials, the cost of much of the material would be written off as a loss. (pp. 2-4, pp. 22-23/GAO Draft Report)

Now on pp. 2-3 and 15-16.

  DOD RESPONSE: Concur. The $88 million in material write-offs represented 5.4 percent of total (direct and indirect) material costs incurred by shipyards during the three year period. As a result of continuing efforts to reduce the generation of excess materials, the naval shipyards have reduced unused inventories awaiting disposal from the $34.7 million reported by the GAO, to $20.2 million, as of March 31, 1994. Concurrently, naval shipyards reduced the value of material still remaining on order for completed work from $11.8 million reported by the GAO, to $9.1 million, as of March 31, 1994.

- FINDING E: Several Factors Contributed to Excessive Orders. The GAO identified and focused on the following factors--within shipyard control--as contributing to excessive material orders:

- shipyards did not routinely identity and analyze the causes for unused material so that corrective actions could be initiated;

- material planners did not have historical material usage information available on previously performed repairs to provide a guide for future orders;

- some material planners made questionable material ordering decisions; and,

- production personnel used unrecorded material to complete repairs instead of the material ordered for the work.

The GAO noted that other factors contributing to excess material, which are outside of shipyard control, include (1) customer changes or cancellations of repair work after material is ordered, and (2) unanticipated changes in material specifications.

The GAO stated that, in response to a 1985 GAO report on shipyard material management (OSD Case 6702), the Naval Sea Systems Command agreed to collect more accurate information on material used during overhauls and implement procedures to analyze actual usage data when ordering material for future overhauls. The GAO found, however, that a system to provide actual usage information was never implemented. (pp. 23-28/GAO Draft Report)

Now on pp. 16-18.

DOD RESPONSE: Concur. The DoD agrees that the four factors cited by the GAO have caused material to go unused after job completion. However, as noted by the GAO, factors that are beyond shipyard control contribute significantly to the excess material problem. The Naval Sea Systems Command does not collect statistics regarding the value of material that becomes excess as a result of factors outside of shipyard management control. The following examples illustrate that point:

- The U.S.S. TEXAS was in the middle of a refueling overhaul at the Puget Sound Naval Shipyard when the decision was made to inactivate the ship. A large percentage of the material designated for overhaul work had already been received. The shipyard estimates that, as a result of the decision to inactivate he U.S.S. TEXAS, about 24,000 line items, valued at $7.0 million of material, became excess and required disposition action.

- A refueling overhaul scheduled for the U.S.S. BATON ROUGE at the Mare Island Naval Shipyard was subsequently changed to a deactivation. Similarly, an availability scheduled for the U.S.S. RUSSELL at Mare Island was

changed to a deactivation. In both cases, material ordered for repair work on those ships became excess when the deactivation decision was made.

- When the decision was made to replace, rather than repair, the oxygen-nitrogen plant on the U.S.S. ROOSEVELT at the Norfolk Naval Shipyard, approximately $75,000 of material received to perform repair work became excess.

- Because of funding shortfalls experienced during planning for the U.S.S. LEFTWICH availability at the Pearl Harbor Naval Shipyard, abrupt changes (work cancellations, work reinstatements, and job site changes) were made to the work package and associated material requirements after 90 percent of the material had been ordered. That is expected to result in material excesses occurring after work starts on June 20, 1994.

Further, Naval Sea Systems Command material ordering guidance requires that contingency material orders having unit cost in excess of $2,000 be approved by the shipyard Engineering and Planning Officer and that orders of contingency material, with unit cost in excess of $5,000, be coordinated with the customer. Shipyard planners are authorized to order lower cost material on a contingency basis, based on their experience and judgment. It is expected that resources being made available to material planners under the Advanced Industrial Management system (described in the DOD Response to Finding B) will enhance their ability to project usage for contingency material.

o FINDING E: Instructions Prohibited Unrecorded Material. The GAO reported that unrecorded material, commonly referred to as "goldpiles" by shipyard personnel, is defined as any material that is not recorded on inventory records. The GAO pointed out that Navy instructions require the return of any issued material not being used so that the material can be added back on the inventory records and an accounting adjustment made to the cost of the repair.

The GAO stated that unrecorded material results when production personnel do not return unused parts, but instead retain the material in the shop area for possible future use. The GAO observed that no official records are maintained on the material, which is usually stored on shelves or in lockers, cabinets, or closets in the shop area. The GAO stated that, except for pre-expended and work-in-process material, Navy instructions prohibit the accumulation of unrecorded material. (pp. 4-5, pp. 30-32/GAO Draft Report)

Now on pp. 3-4 and 20-21.

DOD RESPONSE: Concur. It should be noted that, in addition to ready-for-issue material reviewed by the GAO, unrecorded material may consist of material that has been removed or replaced during the course of previous repair work, as

Enclosure
Page 7 of 18

well as material that was ordered, but not used for repair work. Material in the former category typically does not meet "ready-for-issue" criteria needed for return to the supply system and would be disposed of as scrap. However, because such material may be usable by the shipyard in future work, Naval Sea Systems Command policy does not prohibit the holding of such material in production spaces, but requires that such material be minimized.

- FINDING G: Shipyards Have Large Unrecorded Inventories. In response to a prior report (OSD Case 6702), the GAO indicated the Navy had agreed that the one-time special project to have shipyards identify and record all "goldpile" material would begin by June 1, 1985--and would be completed in 2 to 3 years. The GAO found that the project was undertaken and large amounts of material were identified and added back on inventory records; however, little was done to prevent the problem from recurring. During the current review, the GAO discovered that the Norfolk and Puget Sound shipyards still had significant quantities of unrecorded material. For example, the GAO reported that Norfolk material analysts collected data showing "goldpile" inventories were a problem at the shipyard. The GAO stated that, between April 1992 and October 1993, material costing about $1.3 million was ordered for specific repairs, but was not used because production shops completed the repairs with "goldpile" material. (pp. 4-5, pp. 32-36/GAO Draft Report)

Now on pp. 3-4 and 21-25.

DOD RESPONSE: Concur. It should be noted that the amount of unrecorded material found by the GAO at the Puget Sound Naval Shipyard was significantly less that the amount found at Norfolk. The Naval Sea Systems Command acknowledges that unrecorded material exists to a greater or lesser extent at all naval shipyards and will take action to strengthen management control over unrecorded inventories.

- FINDING H: Some Unrecorded Items Are Being Purchased. The GAO reviewed records maintained by inventory managers for the wholesale supply system to determine if material was being purchased that was available from goldpiles at the Norfolk and Puget Sound shipyards. Based on the GAO sample, the GAO concluded the supply system had outstanding orders for many of the items--17 percent at Norfolk and 6 percent at Puget Sound--and that use of the "goldpile" material could have reduced the need to purchase some of the material. (pp. 4-5, pp. 36-37/GAO Draft Report)

Now on pp. 3-4 and 25-26.

DOD RESPONSE: Concur. However, in calculating the potential system use percentages, the GAO considered only standard material (i.e., material having a National Stock Number assigned) in ready-for-issue condition that was in its

Enclosure
Page 8 of 18

Now on pp. 3-4 and 26.

original packaging. As indicated in the DoD Response to Finding F, much "goldpile" material is non-standard and not in ready-for-issue condition. Accordingly, the actual percentage of all "goldpile" material that could be used by the supply system is lower.

- FINDING I: Factors Contributing to Unrecorded Material. According to the GAO, the instructions prohibiting "goldpiles" are clear. The GAO reported, however, that according to Norfolk and Puget Sound officials, use of "goldpiles" had been a common practice in many work centers in order to meet production schedules. In addition, the GAO noted that according to Command officials, many shipyard personnel do not perceive any benefit would result from the turn-in of unrecorded material--i.e., that it is better to keep the material in the shop.

  The GAO reported that, according to Naval Sea Systems Command officials, it was recognized management attention was needed to prevent the accumulation of "goldpiles". The GAO noted that Naval Sea Systems Command instructions require shipyard managers to make periodic visits to production areas to search for unrecorded material. The GAO found,however, that neither the Norfolk nor Puget Sound shipyards had instructions requiring such visits, and officials at both shipyards stated that spot checks for unrecorded material rarely occurred. The GAO pointed out that periodic visits have worked at naval air depots where commanding officers had given personal attention to the problem by making unannounced shop visits to search for unrecorded material. (pp. 4-5, pp. 38-39/ GAO Draft Report)

  DOD RESPONSE: Concur. The Navy recognizes the need for continual management attention to prevent the accumulation of unrecorded material in shipyards. Accordingly, the Naval Sea Systems Command directed shipyard commanders, by letter dated April 4, 1994, to reduce "goldpiles" and conduct periodic sweeps of production spaces to identify and correct situations where unrecorded materials were being allowed to accumulate.

- FINDING J: Some Shop Store Issues Are Not Justified. According to the GAO, most material used to accomplish ship repairs is ordered from the wholesale supply system or from vendors; however, a significant amount of material was obtained from shipyard shop stores. For example, the GAO reported that, for the refueling overhaul of the U.S.S. CALIFORNIA (completed in 1993), the Puget Sound shipyard issued $15.7 million in material obtained from the supply system or vendors and $8.5 million in material obtained from shop stores.

Enclosure
Page 9 of 18

Now on pp. 28-31.

The GAO found that shop store issues can be approved by shipyard production supervisors who are responsible for completing repair work, but are not accountable for meeting ship repair material budgets. The GAO pointed out that no additional approval or review is required from project managers or other officials accountable for the material budgets. The GAO concluded that, without such controls, it was easier for production personnel to obtain more material than necessary for a repair task.

In addition to shop store material used directly for ship repairs, the GAO observed that production supervisors approved shop store issues for indirect items such as flashlights, batteries, padlocks, and work gloves. The GAO pointed out that, as with direct material, adequate controls are needed to limit the issue of such items to those essential for production work. The GAO found several examples where the shipyards issued large quantities of items with personal use value over the past two years. (pp. 42-48/GAO Draft Report)

DOD RESPONSE: Concur. Although the numbers reported by the GAO for issues of items with personal benefit appear high, they are not unreasonable when viewed in terms of the number of items per production employee. For example, the number of flashlights issued per production worker at naval shipyards in FY 1993 varied from .47 at the Long Beach Naval Shipyard to 2.21 at the Puget Sound Naval Shipyard. The number of pairs of leather gloves issued from shop stores varied from 3 pairs per worker at Puget Sound to 6 at Norfolk during the same period. The number of D-cell batteries issued per production worker ranged from 7 at Portsmouth to 24 at Charleston. As non-production shipyard employees also have occasional need for flashlights, gloves, etc., these statistics represent a "worst case" usage rate.

The Department agrees with the GAO that some shop store material was drawn in excess to actual job requirements and that some issues were not processed properly. Corrective actions are discussed under the DoD responses to Recommendations 6 and 7.

- FINDING K: Shop Store Excess Inventories Exceed Goal. The GAO found that shop store inventories contain large quantities of excess material. According to the GAO, command and shipyard officials advised that some shop store material becomes excess as a normal by-product of ship repair work. For example, the GAO reported excesses develop as a result of workload changes and forecasting and ordering errors. The GAO asserted that excess inventories should be minimized because such inventories (1) tie up financial resources, (2) add to storage and physical inventory costs, and (3) result in waste if inventory managers buy material to meet requirements that could have been met if the excess material had been returned to the wholesale supply system.

Enclosure
Page 10 of 18

Now on pp. 4-5 and 32-33.

The GAO pointed out that the Naval Sea Systems Command had recognized and established policies and goals for the management of shop store excess inventories. The GAO reported that the Command defined excess material as the quantity exceeding a predetermined amount, plus 24 months of demand. According to the GAO, the policies require shipyards to identify and return the excesses quarterly to the supply system for possible credit. In addition, the GAO noted that the Naval Sea Systems Command also established a goal that no more than 5-percent of each shipyard shop stores inventory should be excess. The GAO found, however, that the shop store excess inventories at each shipyard exceeded the goal at the end of FY 1993. In addition, the GAO selectively sampled some of the excess inventory and found that purchases were occurring to meet requirements, even though the excess inventory on hand was sufficient to meet the needs of the shipyard for years. (p. 6, pp. 48-51/GAO Draft Report)

DOD RESPONSE: Concur. The Naval Sea Systems Command has long recognized the problem of excess inventory buildup in shop stores and has reduced shop store inventories from $217 million in 1989 to $177 million currently. However, the initial focus of that inventory reduction effort was on one segment of the excess: "inactive stock"--items that had no demand for the preceding 24 months. In September 1993, after reaching an acceptable level of inactive stock, the Naval Sea Systems Command focused on the "long supply" segment of the excess problem. Material is considered to be in long supply if quantity on hand exceeds the reorder objective, plus 24 months of anticipated usage based on past demand.

The amount of material that is considered in "long supply" is recomputed regularly to reflect the latest demand history. In the current period of declining demand, material brought into stock based on previous demand gradually becomes excess as it is not used and as authorized levels are recomputed. As a result, the amount of material in long supply at naval shipyards is significant, especially at the Puget Sound Naval Shipyard where the rapid decline in repair work has caused nearly 50 percent of the shop store inventory to be considered excess.

However, the Naval Sea Systems Command has deliberately avoided a costly policy of immediate disposal of excess shop store material in favor of a gradual inventory reduction through consumption, reduced replenishment, and minimal write-offs against operating results. That approach is considered prudent. Budgetary constraints prohibit writing-off $40 million in surplus inventories and incurring personnel costs associated with processing large quantities of material.

In the past, the Naval Sea Systems Command has obtained only 10 percent to 15 percent credit for standard material returned to the supply system from shop

store excesses. That experience parallels the GAO finding that only 11 percent of excess items sampled were required by supply system inventory managers. Further, 46 percent of shop stores inventories are nonstandard (not stocked by the DoD supply system) and disposal of those inventories would constitute a total investment loss of material. Accordingly, the Naval Sea Systems Command will continue to reduce shop store excess inventories in a manner that minimizes budgetary impact and resultant cost to customers.

- FINDING L: Material Assets Are Not Adequately Protected From Loss. The GAO stated that internal controls, such as periodic physical inventories, material control procedures, and individual accountability, are needed to help ensure accurate inventory records and protection of material assets against waste or loss. The GAO found that such controls at the Norfolk shipyard were not effective and, as a result, inventory records were inaccurate and funds were wasted because repair material was lost. The GAO noted that the Naval Sea Systems Command requires each shipyard to conduct physical inventories of both shop store and direct materials. The GAO reported that the Puget Sound shipyard met the requirements; however, the Norfolk shipyard met the requirement for shop stores, but not for direct materials.

  The GAO reported that the Naval Sea Systems Command requires that physical inventories be taken of direct materials held for each ship overhaul scheduled to exceed 8 months or 50,000 labor days and annual inventories of direct materials held for unspecified future use. The GAO found that the Norfolk shipyard was generally in non-compliance with the control procedures. As a result, the GAO judgmentally selected 27 line items of material and compared the location and quantity on hand shown on the inventory records with the actual location and quantity on hand. The GAO found that the location was incorrect for 22 percent of the selected items and the on-hand quantity was incorrect for 15 percent of the selected items.

  The GAO reported that, according to Norfolk shipyard officials, lost material was a problem and several articles in the Norfolk shipyard newsletter discussed lost material, its impact on shipyard costs, and some steps the shipyard was taking to address the problem. The GAO noted that, during a two month period, 94 reports of lost material were filed at Norfolk and replacement material costing $63,000 had to be ordered. The GAO learned that the inventory accuracy office attributed the loss to lax enforcement of control procedures and a failure of management to hold individuals accountable for lost material.

  The GAO reported that Puget Sound shipyard officials advised lost material was not a problem at the shipyard. The GAO noted, however, that an analysis similar

Now on pp. 5 and 34-35.

to that performed by the Norfolk inventory accuracy officer had not been done at the Puget Sound shipyard. Furthermore, the GAO noted that the Puget Sound shipyard wrote off $203,000 in lost material in FY 1993, primarily as a result of physical inventories. In comparison, the GAO reported the Norfolk shipyard wrote off $164,000 in FY 1993 as a result of physical inventories. (pp. 5-6, pp. 51-54/GAO Draft Report)

DOD RESPONSE: Concur. The failure to conduct required inventories of direct material at the Norfolk Naval Shipyard is an isolated instance of noncompliance with Naval Sea Systems Command policy and does not reflect the situation at other shipyards where inventories are being conducted properly. Over the past year, six of the seven remaining shipyards reported meeting the Naval Sea Systems Command goal of 98 percent inventory accuracy in direct material inventories. (The exception, the Mare Island Naval Shipyard, reported direct material inventory accuracy of 96 percent). The GAO draft report fails to mention that its spot check of inventory accuracy at the Puget Sound Naval Shipyard found 100 percent inventory validity.

It should be noted that the problem with lost material at Norfolk was identified by shipyard management prior to the GAO review and corrective action was being implemented. The corrective action included educating shipyard employees regarding the impact of lost material, strengthening the property pass system, and delaying the issue of material to production shops until needed to start work. No similar problems involving lost material have been found at other naval shipyards.

The value of inventory losses at the Puget and Norfolk Naval Shipyards, as reported by the GAO, are within the tolerance for inventory adjustments established for Navy stock points by Naval Supply Systems Command Instruction 4440.115G. That directive stipulates that inventory adjustments should not exceed 1 percent of dollar value throughput. The losses by inventory at Norfolk ($164,000) and Puget ($203,000) represent approximately 0.4 percent of annual throughput, are not considered excessive, and do not indicate inadequate material controls.

* * * * *

RECOMMENDATIONS

- RECOMMENDATION 1: The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, require each shipyard to identify and analyze the causes of unused material as a step toward

Enclosure
Page 13 of 18

Now on p. 19.

developing strategies to improve the accuracy of material orders. (p. 29/GAO Draft Report)

DOD RESPONSE: Concur. By letter dated May 24, 1994, the Naval Sea Systems Command directed shipyards that had not already done so to identify and analyze the causes of unused material. Further, the Naval Sea Systems Command directed that such information be provided to material planners for use in identifying material requirements for future work. Shipyards were directed to report implementation of such procedures by July 15, 1994. It should be noted that procedures to analyze unused material and provide feedback to planners are already in place at the Portsmouth and Long Beach Naval Shipyards.

Now on p. 19.

- RECOMMENDATION 2: The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to ensure the planned system to collect historical material usage information is successfully implemented. (p. 29/GAO Draft Report)

DOD RESPONSE: Concur. A system to collect historical material usage information will be implemented as part of the Baseline Advanced Industrial Management system being implemented at five naval shipyards during the period May through August 1994. (Note: The Advanced Industrial Management system will not be implemented at the Charleston, Mare Island and Philadelphia Naval Shipyards since those shipyards are scheduled to close in 1996.) The usage data collection system will be further refined in future releases to the Advanced Industrial Management system. Completion is scheduled for June 1995.

Now on p. 19.

- RECOMMENDATION 3: The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to direct shipyard planners to order contingency material only when there is a sound basis for doing so. (p. 29/GAO Draft Report)

DOD RESPONSE: Concur. By letter dated May 24, 1994, the Naval Sea Systems Command directed shipyard commanders to comply with restrictive policies on ordering contingency material. As noted in the DoD response to Finding E, Naval Sea Systems Command policy does not prohibit the ordering of contingency material, but requires that high value contingency material orders be based on sound judgment and approved at a supervisory level above the material planner.

Enclosure
Page 14 of 18

Now on p. 27.

- RECOMMENDATION 4: The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to direct shipyards to (1) identify and retain only those materials that have a specific shipyard requirement, (2) return all other needed materials to the supply system, and (3) dispose of materials no longer needed. (p. 40/GAO Draft Report)

  DOD RESPONSE: Concur. By letter dated April 4, 1994, the Naval Sea Systems Command directed shipyard commanders to reinvigorate efforts to control and reduce "goldpiles". Specifically, shipyard commanders were directed to publish and implement instructions for periodic sweeps of production spaces in order to identify and turn in "goldpile" material.

  The overall effect will be as follows -- "goldpile sweeps" will identify unrecorded material; unrecorded material will be recorded on accountable records; the accountable records will be made visible both within and outside the shipyard community to fill other system requirements.

  At the Norfolk Naval Shipyard, where the GAO found significant amounts of unrecorded material, a process action team has been established to determine a strategy for reducing "goldpiles" within available resources. Currently ten production shops have been scheduled for a "goldpile sweep" where unrecorded material will be identified and processed for return. The effort to identify and turn-in unrecorded material that began at the Puget Sound Naval Shipyard prior to the GAO visit is expected to be completed by September 1, 1994. A target completion date for resolution of the unrecorded material at all shipyards will be established after the shipyards have developed strategies for processing unrecorded materials in response to the April 4, 1994 letter.

Now on p. 27.

- RECOMMENDATION 5: The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to direct that top management at each shipyard make periodic spot checks for unrecorded material to help prevent the future accumulation of unrecorded inventories. (p. 40/GAO Draft Report)

  DOD RESPONSE: Concur. As discussed in the DoD Response to Recommendation 4, the Naval Sea Systems Command has directed shipyard commanders to publish local instructions ensuring that periodic checks of production spaces be conducted by management personnel. Shipyards will report compliance with that requirement by July 5, 1994. Further, the Naval Sea Systems Command Inspector General is in the process of revising the Functional Area Guide for Supply and Material Management, to include a review of management compliance with the spot check requirement during command inspections.

Enclosure
Page 15 of 18

Now on p. 36.

- RECOMMENDATION 6: The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to require that project managers, or other officials accountable for material budgets, review shop store issues for ship repairs. (p. 55/GAO Draft Report)

DOD RESPONSE: Concur. The Naval Sea Systems Command is in process of implementing two concepts which will provide greater control of material issues to production operations:

- The "project manager" type of organization being implemented in shipyards assigns singular responsibility to the project manager for meeting the material budget for his project. As a result of that responsibility, project managers have identified and stopped charges to their projects which were not legitimate.

- The work packaging and control module of the Advance Industrial Management system is designed to provide all material to the production worker at the start of a job. That will rigorously control material provided to production workers and reduce the need for across-the-counter issues of material for planned work. Target date for implementation at the five shipyards that are not scheduled for closure is June 1995.

Now on p. 36.

- RECOMMENDATION 7: The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to establish additional controls over issues of items with personal use value. (p. 55/GAO Draft Report)

DOD RESPONSE: Concur. By letter dated June 13, 1994, the Naval Sea Systems Command directed that all naval shipyards immediately begin recording employee badge numbers for shop store issues and that issue volume by badge number be reviewed to identify possible abuse. By imputing badge numbers into the automated shipyard inventory system at the time the issue is recorded, a historical record will be maintained which identifies recipients of items with personal benefit. Data extracts could be obtained which identify employees receiving unusually high quantities of these items. Such a system is already in place at the Charleston Naval Shipyard. In addition, the Naval Sea Systems Command will enhance control over issues of shop store material by implementing the project management concept and the Advanced Industrial Management system, as discussed in the DoD response to Recommendation 6.

Enclosure
Page 16 of 18

Now on p. 36.

- RECOMMENDATION 8: The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to direct the shipyards to eliminate shop store excess inventories that exceed retention criteria of the Naval Sea Systems Command. (p. 55/GAO Draft Report)

DOD RESPONSE: Concur. However, as noted in the DoD Response to Finding K, the Naval Sea Systems Command will reduce excess inventories gradually, through a combination of reduced replenishment, consumption, and write-offs within budgetary limitations. The following actions have been taken:

- Replenishment designators in the automated material management system for shop stores were reset in November 1993, to reduce replenishment quantities.

- FY 1996/1997 budget guidance to shipyards reiterated the requirement to establish an allowance for inventory loss to cover write-offs of excess inventories. The objective is to allow periodic write-off of excess inventories in a financially prudent manner that absorbs loss over time.

Given the current declining workload forecasts and budget constraints, it is anticipated that at least two years will be required to reduce excess shop store inventories to acceptable levels at shipyards that remain operational. The target completion date is September 30, 1996. Inventories at shipyards selected for closure will be redistributed or disposed of prior to closure, now targeted in late FY 1996.

The Naval Sea Systems Command has been engaged in discussions with the Naval Supply Systems Command to establish connectivity between shipyard and stock point automated material systems. The objective is to make shipyard shop store inventories visible to all Navy and DoD users, while the material remains in place. That would obviate the need to physically turn-in excess inventories (and record an associated financial loss for turn-ins without credit) in order to make excess material available to other DoD consumers.

The discussions are part of ongoing Naval Sea Systems Command explorations into expanded partnerships with the Navy Fleet and Industrial Supply Centers. A prototype of a new partnership alignment will be initiated in June 1994, when receiving, storage, and issue operations at the Long Beach Naval Shipyard are consolidated with those at the Fleet and Industrial Supply Center, San Diego. Assuming the prototype succeeds, connectivity with the shipyard automated system is targeted for December 1994, when system-wide visibility over Long Beach Naval Shipyard assets will be possible. Expansion of the initiative to other shipyards is dependent upon results at Long Beach.

Enclosure
Page 17 of 18

Now on p. 36.

- **RECOMMENDATION 9:** The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, to ensure that shipyards comply with requirements for physical inventories of direct material. (p. 55/GAO Draft Report)

  DOD RESPONSE: Concur. Reorganization of material functions at the Norfolk Naval Shipyard, and failure to assign responsibility for conduct of required direct material inventories, resulted in the problem found by the GAO. Responsibility for conducting inventories has since been assigned, and the Norfolk Naval Shipyard conducted required inventories of direct material held for availabilities with the U.S.S. ROOSEVELT and U.S.S. SAIPAN in November 1993 and March 1994, respectively. The Norfolk Naval Shipyard has scheduled future inventories in September and December 1994. The Naval Sea Systems Command will monitor compliance with physical inventory requirements at all naval shipyards and take corrective action where needed.

Now on p. 36.

- **RECOMMENDATION 10:** The GAO recommended that the Secretary of the Navy direct the Commander, Naval Sea Systems Command, (1) to determine the causes for lost material, and (2) to develop strategies to reduce the losses. (p. 55/GAO Draft Report)

  DOD RESPONSE: Concur. As indicated under the DoD Response to Finding L, a problem with lost material, similar to that being addressed by the Norfolk Naval Shipyard, has not been found at other naval shipyards. However, in response to the GAO recommendation, the Naval Sea Systems Command will charter a process action team comprised of shipyard personnel to assess the magnitude of the lost material problem at other shipyards. Target date for establishment of the process action team is July 15, 1994, with analysis and recommendations to be provided by January 1, 1995.

Enclosure
Page 16 of 18

Major Contributors to This Report

National Security and International Affairs Division, Washington, D.C.	James Murphy, Assistant Director
Norfolk Regional Office	Dudley Roache, Regional Management Representative Gary Phillips, Evaluator-in-Charge James Ellis, Site Senior

Ordering Information

The first copy of each GAO report and testimony is free. Additional copies are $2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:

U.S. General Accounting Office
P.O. Box 6015
Gaithersburg, MD 20884-6015

or visit:

Room 1100
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders may also be placed by calling (202) 512-6000 or by using fax number (301) 258-4066.

Each day, GAO issues a list of newly available reports and testimony. To receive facsimile copies of the daily list or any list from the past 30 days, please call (301) 258-4097 using a touchtone phone. A recorded menu will provide information on how to obtain these lists.