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NAVY INVENTORY MANAGEMENT

Improvements Needed to Prevent Excess Purchases



**National Security and
International Affairs Division**

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April 30, 1998

The Honorable J. Dennis Hastert
Chairman
The Honorable Thomas M. Barrett
Ranking Minority Member
Subcommittee on National Security,
International Affairs, and Criminal Justice
Committee on Government Reform and Oversight
House of Representatives

This report is one in a series of reports on the Department of Defense's (DOD) management of secondary inventory—spare and repair parts and other items that support DOD's operating forces on land, at sea, and in the air.¹ Over the past several years, we have issued a number of testimonies and reports that cite the management of defense inventory as a high-risk area.²

As requested, we focused this review on excess inventory the Navy had on order. Specifically, this report addresses whether the Navy (1) had valid requirements to support inventory purchases, (2) had purchased items that exceeded needs and the causes of this condition, and (3) was canceling purchases that exceeded needs.

Background

Inventory management comprises several major functions, including determining what is needed; buying needed items; and storing, maintaining, distributing, and disposing of these items once they are received. Inventory control points, along with other activities such as maintenance depots and disposal activities, perform these inventory management functions.

This report focuses on the Navy's processes for determining inventory requirements and making related purchases. These functions are primarily the responsibility of the Naval Inventory Control Point, which has offices in Philadelphia and Mechanicsburg, Pennsylvania. These functions are

¹See Related GAO Products at the end of this report.

²In 1990, we began a special effort to review and report on the federal program areas designated as high risk because of their vulnerabilities to waste, fraud, and abuse. This effort, which was supported by the Senate Committee on Governmental Affairs and the House Committee on Government Reform and Oversight, focused on problems that were costing the government billions of dollars. We identified DOD's secondary inventory management as a high-risk area at that time because of the high levels of inventory in excess of current needs and the lack of adequate systems for determining inventory requirements.

important because the Navy annually purchases \$3.1 billion of inventory and has an on-hand inventory valued at \$16.8 billion.

The Navy uses an automated process called Supply Demand Review as the primary means to assist item managers in determining how much inventory needs to be purchased and when and if contracts need to be awarded, canceled, or modified. The process uses inventory data and mathematical models to determine inventory needs and to compare the needs to on-hand and due-in inventory. Due-in inventory represents items on purchase requests,³ items that have been ordered but not received, and items the Navy already owns but are in transit between activities.

Inventory requirements considered during the process include one or more of the following:

- Reorder level requirement. This requirement is for stock needed during the time it takes to purchase or repair an item plus a safety level of stock in case of unexpected increases in demand or the time needed to purchase or repair an item.
- Planned program requirement. This requirement is for (1) pools of parts that permit the timely completion of repairs scheduled at maintenance depots or the unscheduled replacement of failed parts and (2) parts for future needs such as ship or aircraft modifications that have specific dates on which the parts are needed.
- Due out requirement. This requirement is used to satisfy requisitions for stock that is on hand and not yet sent to the customers.
- Backorder requirement. This requirement is used to satisfy requisitions that have been received but cannot be satisfied from stock on hand.
- War reserve requirement. This requirement is used to ensure fast mobilization in the event of war.

When an item manager determines that more items are needed than are on hand and due in, a contract is generated for the quantity that is needed plus an economic order quantity—the amount of inventory that will result in the lowest total costs for ordering and holding inventory. A contract can be terminated or modified if requirements change.

Our analysis of September 30, 1996, computerized Navy inventory files showed that the Navy was purchasing a reported \$1.6 billion of secondary inventory, \$121 million of which exceeded requirements and economic

³Item managers issue an internal document called a purchase request when they determine that inventory needs to be purchased. Inventory is considered to be on a purchase request until a contract is awarded.

order quantities. We judgmentally selected 200 items with a reported \$48.3 million of inventory on contract that were not needed as of September 30, 1996. We reviewed these items to determine if the Navy had valid requirements to support inventory purchases, what caused purchases to exceed requirements, and what the Navy was doing to cancel purchases that were beyond what was needed. Although this report concentrates on the processes for determining inventory needs and canceling excess purchases, past reports have discussed problems with the visibility and accuracy of on-hand and in-transit inventories. The scope and methodology of our work are described in appendix I.

Results in Brief

We identified several problems that affect the decision-making process for billions of dollars of inventory. However, we cannot precisely quantify the overall extent of the problems. Specifically, our work shows that in some cases purchases (1) were not based on valid needs, (2) were excess to needs because the requirements changed after orders were placed, and (3) occurred even though contracts could have been canceled.

- The Navy did not always have valid requirements to support inventory purchases. For example, 68 of the 200 items reviewed had about \$13 million of planned program requirements that could be eliminated because the requirements were also included in the reorder level requirement. This double counting could be indicative of a larger problem because the Navy has a total of about \$3.3 billion in planned program requirements that affect purchase decisions.⁴ We previously recommended that DOD revise policies and procedures to eliminate this duplication of requirements. While DOD has acted on many of our past recommendations, it has not taken corrective action on this one. We also identified other instances where inventory was purchased without an adequate basis.
- Several factors contributed to the excess inventory on contract. Recurring demands for certain items had decreased, engineering estimates for requirements had not materialized, nonrecurring demands were delayed or were not needed, and parts had become obsolete. Although some of these factors could not have been anticipated, in other cases better management could have eliminated or minimized the accumulation of inventory that exceeded needs. The Navy did not know if planned program requirements accurately reflected needs. Also, broken parts to be returned for repair were not adequately considered when making purchase decisions.

⁴The dollar value of a requirement error has something less than a one-to-one relationship to the amount of an item purchased. This is because requirements data are used to identify the aggregate amount of inventory needed over a period of time and not the most economic amount that should be purchased at any one point in time.

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- The Navy canceled some contracts for excess inventory but could have canceled more. A major reason for not canceling more purchases was that the Navy adds “protection levels,” representing as much as 2 years of usage, to requirements before considering cancellation and cancels only the amount of the purchases that exceeds the protection levels. The 2-year usage represented nearly four times the amount of inventory that the Navy would normally buy. The Navy missed additional opportunities to cancel purchases because item managers did not exercise their responsibility to direct the cancellation of contracts, economic analyses were not made, and inventory and contracting records did not agree.

Collectively, these problems contribute to the Navy having inventory in excess of needs.

Inventory Purchases Were Not Always Supported by Valid Needs

Our analysis of 200 judgmentally selected items showed that the Navy duplicates some inventory requirements, resulting in unnecessary purchases and inventory that exceeds needs. Also, inventory was purchased without specific requirements or on the basis of inaccurate demand forecasts.

Some Requirements Were Counted Twice

One of the Navy’s uses of planned program requirements is to provide pools of parts that permit the timely completion of repairs scheduled at maintenance depots or the unscheduled replacement of failed parts. In these situations, the demand generated by the replacement of these parts as they are issued is used to compute reorder levels. The Navy, however, continues to add planned program requirements to these reorder level requirements in determining total requirements. Thus, planned program requirements are counted twice.

Of the 200 items reviewed, 88 items had \$38.4 million of planned program requirements that generated demands used to compute reorder levels. We estimate that about \$13 million for planned program requirements could be eliminated because recurring demands resulting from these requirements were already included in the calculation of amounts to order.⁵ This practice could be of greater significance because the Navy has about \$3.3 billion of planned program requirements that generate demands used to compute reorder levels. Consequently, some part of these requirements could be eliminated, thus ultimately reducing actual

⁵An additional \$18.5 million of planned program requirements for pack-up kits of spare parts are also duplicated in demands used to compute reorder levels. Because the kits are used by units when they deploy, we excluded them from our estimate.

purchases. The following examples show the effect of the double counting:

- In May 1997, Navy supply records showed that the Navy needed to buy two manifold assemblies, used on FFG class guided missile frigates, each costing \$27,895. Requirements included a reorder level of nine assemblies and a planned program requirement for three assemblies. Demands used to compute the reorder level requirement included those to replenish the planned program requirement. As a result, the requirement was counted twice—once as part of the reorder level and again as part of the planned program requirements. By removing the planned program requirements, which represented about 3 years of supply, the need for the buy could have been eliminated and requirements could have been reduced by three assemblies, costing a total of \$83,685.
- In November 1997, the Navy projected a buy for 29 rotary wing blades used on the AH-1W attack helicopter. Requirements included a reorder level requirement of 49 blades and a planned program requirement for 6 blades. Demands used to compute the reorder level included those to replenish the planned program requirements. As a result, the requirement was counted twice—once as part of the reorder level and again as part of the planned program requirements. Eliminating the planned program requirements could have reduced the projected buy by six blades, or about \$412,500. The six blades represent about 6 months of supply.

The Navy took action to eliminate or lessen duplicate requirements in one case. For a self-locking nut used on the engine for the UH-1N utility helicopter, the Navy reduced inventory requirements by 3,456 nuts costing about \$1,700. A February 1996 purchase of 17,120 self-locking nuts was justified by a reorder level of 14,155 nuts and planned program requirements for an additional 4,201 nuts. The Navy subsequently decreased the planned program requirements to 292 nuts. Inventory control point officials stated that the largest part of the decrease was due to deleting planned program requirements for 3,456 nuts. They had determined that recurring demands used to compute reorder levels for the wholesale inventory could be used to support all requirements.

In March 1996,⁶ we recommended that the Secretary of Defense direct the Secretary of the Navy to revise policies and procedures for buy and budget requirement computations to eliminate duplication of depot maintenance requirements related to planned program requirements. DOD agreed that

⁶Defense Logistics: Requirement Determinations for Aviation Spare Parts Need to Be Improved (GAO/NSIAD-96-70, Mar. 19, 1996).

any duplication of requirements should be eliminated, but it disagreed that the Navy was duplicating requirements. DOD stated that planned program requirements and recurring demands (used to compute reorder levels) are both needed to provide sufficient supply support and do not overstate requirements. Our current work shows that this practice still results in overstated requirements and buying more inventory than needed.

Other Purchases Were Not Supported

Our review of the 200 items identified additional instances in which inventory purchases were not supported by valid needs. For example:

- Some purchases were made without specific requirements. Four items that had \$60,000 of inventory on order in excess of needs as of September 1996 were purchased at the direction of the Naval Inventory Control Point commanding officer. According to the item manager, mine countermeasures systems were not operating because parts were not available. As a result, the commanding officer directed across-the-board purchases of mine warfare parts for items without any inventory on hand, irrespective of whether or not they were needed for nonoperational systems. At the time of our review, two of the four mine countermeasure items had \$15,000 of inventory on hand that exceeded requirements and economic order quantities.
- Some purchases were based on inaccurate demand forecasts. Four items (blades and vanes used to repair helicopter engines) had actual demands significantly less than the forecasted demands used to compute requirements. In these cases, the requirements were based on forecasted needs of the Naval Aviation Depot, Cherry Point, North Carolina. The inventory control point uses depot forecasts because historically the demand for blades and vanes has been erratic and dependent on changes in engines and overhaul schedules. For one item, in January 1997, the depot forecasted a 1997 and 1998 requirement for 38,088 (4,761 per quarter) compressor rotary blades. The forecast was used to compute the reorder level of 11,093 blades and an economic order quantity of 9,522 blades, which together resulted in a purchase request for 11,657 blades costing \$25 each. Although only 1,465 blades were used between January and March 1997, the inventory control point did not update the depot's original forecast, but rather used it to compute requirements even though the forecast was no longer valid. In November 1997, over \$800,000 worth of blades and vanes were on either purchase request or contract for three of the items. The item manager said that the depot's workload had not materialized as expected. In January 1998, inventory control point officials stated that they were in the process of updating the demand data.

Changing Needs Caused Excess Inventory Purchases

Using the same 200 items, we performed an analysis to determine why the Navy was purchasing inventory that exceeded needs. For purposes of this analysis, we assumed the Navy's requirements were valid. Changing requirements was the most common reason for having inventory on contract that exceeded requirements and economic order quantities. Recurring demands had decreased, engineering estimates for requirements had not materialized, nonrecurring demands had slipped or were not needed, and parts had become obsolete. In some cases, the changes could not have been anticipated. However, in other cases, better management could have eliminated or minimized the accumulation of inventory that exceeded needs. The effectiveness of using planned program requirements to satisfy future needs was not measured, and purchase decisions did not adequately take into account broken parts to be returned for repair.

The Effectiveness of Planned Program Requirements Is Not Measured

One of the uses of planned program requirements is to provide for future nonrecurring needs for specific purposes, such as ship or aircraft modifications that have specific dates on which the parts are needed. These planned program requirements are generated by commands, such as the Naval Sea Systems Command, which is responsible for managing naval ships and shipboard weapons and combat systems. These requirements are added to other requirements as the date on which a planned program item is needed nears the date on which the item must be ordered to ensure its timely availability. If a customer does not requisition a planned program part, the Navy's supply system automatically deletes the requirement. If material to satisfy the planned program requirement is on order or on hand, deleting the requirement can result in excess inventory.

The Navy does not match all planned program requirements to requisitions to determine if they are effective in satisfying future needs. For 13 items in our review, planned program requirements that did not materialize contributed to excess inventory being on order and eventually on hand. For example, in May 1996, the Navy contracted for one axial piston pump used to hoist and lower small boats on mine hunter class ships. According to the item manager, planned program requirements for four pumps were deleted in August and September 1996. As of May 1997, that pump, costing \$9,364, was on hand in excess of needs.

In another case, in January 1996, the Navy contracted for two electronic displays for the Mark 92 fire control system used on Navy frigates and Coast Guard cutters. According to the item manager, four planned

program requirements were deleted after the buy was made. As of June 1997, one display, costing \$35,144, was on hand in excess of needs.

In still another case, in April 1996, the Navy contracted for 10 rotary switches used on nuclear reactors and associated monitoring equipment. By October 1996, 7 of 15 planned program requirements had failed to materialize and were deleted. As of May 1997, five rotary switches, costing a total of \$987, were on hand in excess of needs.

The validity of planned program requirements and the accumulation of excess inventory when these requirements do not materialize have been long-standing problems. In July 1993,⁷ we recommended that the Navy implement internal controls and monitoring efforts to ensure that (1) planned program requirements are matched to customer requisitions, (2) requirements that are delayed or deleted are analyzed to determine the impact on purchases, and (3) procedures for validating planned program requirements prior to taking procurement actions are developed. The Navy agreed with our recommendations and took specific corrective actions to address them.

In September 1996, the Naval Supply Systems Command issued an instruction calling for measuring the effectiveness of using planned program requirements to satisfy customer needs. The effectiveness measures include matching nonrecurring demand requisitions to planned program requirements to indicate if customers requisitioned the material or if the requirements were deleted without being requisitioned. However, the Command has yet to issue specific guidance on how to implement the effectiveness measures and they have not been implemented.

Inventory control point officials told us that the validity of planned program requirements continues to be a problem when customer requisitions are not matched with these requirements. Customers do not requisition parts purchased to satisfy planned program requirements and excess inventories result.

Parts to Be Returned for Repair Are Not Considered

We identified 12 items for which broken parts' being returned for repair contributed to excess inventory conditions. When a customer requisitions a repairable part, the customer frequently indicates that a broken part will be returned at a later date. The excess inventory conditions occur because

⁷Navy Inventory: Better Controls Needed Over Planned Program Requirements (GAO/NSIAD-93-151, July 1, 1993).

the broken parts to be returned are not counted as due ins in the requirement computations. Therefore, they are not considered in making purchase decisions. This is also important because repairing parts generally is much cheaper than buying new parts. Consequently, parts are purchased that are excess to needs, and solving customers' supply needs is more costly than necessary.

For example, on September 30, 1996, the Navy had 85 inertial navigation systems (for the F/A-18 and AV-8B fighter-attack aircraft) on hand and 3 on contract. Five of the systems, costing \$97,108 each, exceeded the requirements and economic order quantity. By October 1997, the Navy had 109 systems on hand, of which 27 exceeded needs. The number of systems increased because broken system returns exceeded customer requisitions. Over a 2-year period, 464 broken navigation systems were returned for repair and customers requisitioned 372 systems, or 92 fewer than were returned.

The Navy recognizes the problem relating to the tracking of parts being returned for repair. A reengineering project, to be implemented by February 1999, is aimed at accounting for the parts in a more timely manner. However, the project will not result in recording broken parts as due-in inventory so that they can be considered in purchase decisions.

More Purchases Could Be Canceled

We also reviewed the 200 items to determine if there was a greater opportunity to cancel unnecessary purchases. Our review of 200 items with \$48.3 million of inventory on contract that exceeded requirements and economic order quantities showed that the Navy had canceled \$6.7 million of the contracts for 45 items. However, more cancellations could have been made. The Navy added protection levels of inventory, representing up to 2 years of usage, that prevented purchases from being considered for cancellation or limited the amount of the purchases canceled. Additional opportunities to cancel purchases were missed because item managers did not exercise their responsibility to direct cancellation of contracts, economic analyses were not made, and inventory and contracting records did not agree.

Excessive Protection Levels Limit Cancellations

The Navy identifies purchase requests and contracts for cancellation when quantities being purchased exceed the sum of requirements and an added "protection level." The protection level is intended to guard against items' fluctuating between buy and cancellation positions because of demand

changes. The Navy defines the protection level as the greater of (1) 6 months or 1 year of forecasted usage for items on purchase request and 2 years for items on contract or (2) an item's economic order quantity. The amount of a contract that is canceled is the portion that exceeds the protection level. Because the 1- or 2-year usage often exceeds an item's economic order quantity, purchase requests and contracts for inventory that exceed requirements often are not considered for cancellation or the amount of a contract that is canceled is limited by a protection level.

The 2-year usage for 86 of the 200 items exceeded the economic order quantities. While the items had economic order quantities valued at \$19.4 million, the 2-year usage protected \$77.4 million of inventory. In other words, the 2-year usage protected nearly four times the amount of inventory that the Navy supply system would recommend buying. The economic order quantity was sufficient to prevent fluctuations between buy and cancellation positions. For most items, the economic order quantity represented 6 or more months of usage and, in some cases, exceeded the amount of inventory needed to satisfy demand during the lead time required to purchase an item.

For 20 items, the 2-year usage protection level affected the cancellation of \$3.2 million of contracts that exceeded requirements and economic order quantities. For example, in June 1996, the Navy had 308 pilot valve cartridges on contract, of which 227 exceeded needs. The economic order quantity was 43 cartridges but, because the 2-year usage protection level was 168 cartridges, only 59 were canceled. By May 1997, all cartridges had been delivered, leaving the Navy with 511 cartridges on hand. Of this quantity, 261 cartridges, costing \$723 each, exceeded needs and represented a 4-year supply.

In another example, in September 1997, 97 high-pressure turbine shafts used on the engine for the FA-18 fighter-attack aircraft were on hand and an additional 12 were on order at a cost of \$9,695 each. The Navy system did not identify this item for cancellation because the item had a 2-year usage protection level of 84 turbine shafts, instead of the economic order quantity protection level of 21 turbine shafts.

Other Cancellation Opportunities Were Missed

Opportunities to cancel contracts were missed or were not fully explored because item managers did not exercise their responsibility to direct cancellation of contracts, economic analyses were not made, and the

automated inventory system required contracting and inventory files to be in agreement before accepting cancellation recommendations.

According to inventory control point officials, item managers have the responsibility and authority to direct cancellation of contracts. However, item managers did not always exercise their responsibility and authority. Several item managers indicated that contracts were not canceled because contracting officials rejected their attempts to do so. However, inventory control point officials stated that contracting officials do not have rejection authority but merely provide information on the status of contracts and cancellation costs for item managers to use in making decisions.

The following example illustrates a situation where the item manager did not exercise decision-making responsibility, but rather interpreted the information provided by contracting as a rejection of the cancellation attempt. In September 1996, the Navy had 13 extender cards on contract. The cards cost \$12,180 each and are used on nuclear parts cabinets. The item manager said that he attempted to cancel four cards from the contract in October 1996 and two cards in February 1997, but contracting personnel rejected him both times because contract deliveries were pending. However, six cards were still on contract in September 1997. At that time, the requirement was two cards and seven cards were on hand.

Economic analyses were not made to determine if contracts should be canceled. DOD regulations require that the cost-effectiveness of canceling contracts be determined by comparing what it will cost to hold items in inventory with the cost to terminate the same items from contracts. Although several item managers told us that contracts for unneeded material were not canceled because cancellation was not economical, we found no evidence that analyses were made to determine the most economical action. Inventory control point officials said that in the past the Navy used an economic model to make such decisions, but the model was no longer used because the Navy's experience was that it generally was not economical to cancel contracts nearing completion.

If a contract quantity that an item manager recommends for cancellation is greater than the quantity that the contract files show, the supply system automatically rejects the cancellation attempt. Partial deliveries is a major cause of the difference and getting the inventory and contract records to match can be time consuming and costly. For example, in November 1996, the item manager of an annular ball bearing used on the T-58 aircraft

engine attempted to cancel a contract for 315 bearings. The supply system automatically rejected the recommendation because the quantity recommended for cancellation on the basis of the inventory records exceeded the quantity available to cancel in the contract records. Partial deliveries had been made but were not reflected in the inventory records. Several additional attempts were made to cancel the contract, but the attempts were rejected because partial deliveries continued and the item manager was not able to reconcile the inventory and contract records. By September 1997, all contract deliveries had been made, and the Navy had 829 bearings costing \$549 each on hand. Of these, 498 exceeded the requirements and economic order quantity.

According to inventory control point officials, the Navy has initiated a supply system change that will allow termination of quantities that are less than the item manager recommends because of partial deliveries. They expect to implement the change in September 1998.

Conclusions

Having inventory when it is needed is critical to maintaining readiness and sustainability of Navy weapons and equipment. Ineffective and inefficient inventory management practices result in limited purchasing resources' being applied to items where there already is sufficient inventory to support needs. Correcting these problems would make more funds available for those items where needs are not being met. While we cannot precisely quantify the overall extent of the problems discussed in this report, we do know that the problems affect the decision-making process for purchasing billions of dollars of inventory.

Inventory purchases often were not based on valid needs. The Navy continued to count some inventory requirements twice and unnecessary inventory purchases resulted. Demands for planned program requirements were also included in the reorder level requirement. Although DOD and the Navy believe this double counting is needed, in one case the Navy demonstrated that using the reorder level to satisfy planned program requirements was practical and could support all requirements.

Changing requirements was a major cause of the excess inventory on contract. However, better management could have minimized or eliminated the accumulation of some inventory that exceeds needs. For example, measuring the effectiveness of planned program requirements in meeting future needs and accounting for broken part returns are two areas needing improvement.

The Navy also could do a better job of canceling purchases that exceed requirements. Excessive protection levels, representing up to 2 years of usage, prevented purchases from being considered for cancellation or limited the quantities canceled. Sometimes, item managers did not exercise their responsibility to direct cancellation of contracts, economic analyses were not made, or inventory and contract records did not reconcile.

Collectively, the identified problems demonstrate the need to strengthen management oversight and controls over the processes for determining inventory needs and canceling excess purchases.

Matter for Congressional Consideration

Our past report and current work have demonstrated that counting inventory requirements twice—once as planned program requirements and again as part of the reorder level requirement—can result in major expenditures for unnecessary inventory purchases. Because DOD did not agree with and took no action on our past report's recommendation to eliminate duplication of these requirements, the Congress may wish to consider requiring the Secretary of Defense to direct the Secretary of the Navy to issue guidance revising the Navy's requirements computation process to eliminate planned program requirements that are duplicated in reorder levels.

Recommendations

We recommend that the Secretary of Defense direct the Secretary of the Navy to strengthen management oversight procedures and internal controls over the processes for determining inventory requirements and canceling excess purchases. Specifically, the Secretary of the Navy should direct that the following actions be taken.

- Improve the validity of requirements by, among other things, (1) updating depot demand forecasts in a timely manner, (2) implementing current Navy guidance for measuring the effectiveness of using planned program requirements to satisfy nonrecurring demands by matching customer requisitions with these requirements, and (3) recording broken parts to be returned for repair as due ins when computing requirements.
- Improve the process for canceling contracts where items are excess to needs by (1) eliminating 1- and 2-year protection levels when considering purchases for cancellation, (2) reemphasizing to item managers that they have the responsibility and authority to direct cancellation of contracts, (3) requiring economic analyses to determine if it is economical to cancel

contracts for excess material, and (4) automatically adjusting item manager cancellation recommendations when the recommended quantities exceed the quantities available to cancel.

Agency Comments and Our Evaluation

DOD partially agreed with the report and our recommendations, but did not agree with the matter for congressional consideration (see app. II for DOD's complete comments).

With regard to our recommendations on improving the validity of the Navy's inventory requirements, DOD agreed with our recommendation on effectiveness measures, partially agreed with our recommendation on updating depot demand forecasts, and disagreed with our recommendation to record broken parts as due-in assets. DOD stated that the Naval Supply Systems Command will provide detailed guidance to the Naval Inventory Control Point on measures of effectiveness for planned program requirements. The inventory control point will then develop and implement measurement tools by March 1999.

DOD agreed that Navy depot demand forecasts should be updated in a timely manner but stated that (1) the Navy should not adjust procurements on the basis of one quarter of demand fluctuations and (2) demands are reviewed when making buys. We did not recommend that the Navy adjust procurements on the basis of one quarter of demand. We recommended that depot demand forecasts be updated in a timely manner. Our point is that the item manager had not taken steps to verify the forecasted demand. For example, even though the depot's workload had not materialized as expected, forecasts were not updated 11 months into the forecast period. These items represented inventory valued at over \$800,000 on either purchase request or contract and, as such, a more timely review and update of the demand data could possibly have prevented excess purchases.

DOD did not agree that broken parts to be returned for repair (referred to as carcass returns by DOD) should be recorded as due-in assets when computing requirements. DOD stated that parts failure predictions are included in the requirements computation process. We recognize that the Navy includes these parts in requirement computations. However, the Navy does not include broken parts to be returned for repair as part of the on-hand and due-in inventory that is compared to these requirements when making purchase decisions. To determine how much inventory to purchase, the Navy supply demand review process computes requirements

and compares on-hand and due-in inventory to the requirements. By not offsetting broken parts being returned by customers against requirements, the amount of material needed to be purchased can be overstated. Therefore, we made no revisions to our recommendation.

With regard to our recommendations on improving the process for canceling contracts where items are excess to needs, DOD agreed with our recommendations on contract cancellation responsibilities and cancellation quantity adjustments. However, DOD disagreed with our recommendations on eliminating protection levels and performing economic analyses. DOD stated that the Navy will reiterate contract termination policy and procedure with its item managers and buyers within 90 days. The Navy plans to clearly state that item managers have the authority and responsibility to terminate a contract when the stock position warrants. The Navy also will institute a policy that a buyer may not reject a termination without written concurrence from the item manager unless the quantity has been shipped or the contract is already being terminated for default. Concerning our recommendation on cancellation quantity adjustments, the Navy noted a change in process that would eliminate the potential for contract terminations' being rejected. The change relates to situations where the quantity an item manager recommends for cancellation is greater than what is available to terminate in the contract records. The change will be implemented in the first quarter of 1999.

DOD did not agree with our recommendation to eliminate protection levels when considering whether to cancel a purchase. DOD stated that protection levels are justified because of the costs associated with placing and terminating contracts and the activities associated with buying, terminating, and buying items again (referred to as churn by DOD). DOD also stated that protection levels do not affect the termination decision for most items. Our work shows protection levels do have a major effect on which contracts are considered for termination. To illustrate, 86 items had quantities valued at \$58 million that were not considered for termination because of the 2-year protection level. These quantities exceeded requirements and economic order quantities. Our analyses showed that economic order quantities represented about 6 months of usage, which are sufficient to protect against "churn." Additionally, the contracting and termination costs DOD cited represent less than 10 percent of the potential savings that could result from terminating a contract. In view of the above, we made no revisions to our recommendation.

DOD also did not agree with our recommendation that economic analyses be performed to determine if it is economical to cancel contracts for excess material. DOD noted the Navy's policy to pursue the termination of all contracts that represent excess due-in material but stated that the Navy's past experience with an economic termination model showed that the model did not achieve the intent of promoting the termination of unneeded material. We recommended that the Navy make economic analyses, but did not specify that they use their model. A June 1993 DOD Inspector General report stated that the Navy contract termination model did not use a reasonable approach to estimating termination costs.⁸ The Inspector General recommended that DOD (1) establish specific criteria for determining the benefits of terminating unneeded material on contract and (2) direct the components to revise their contract termination models to conform with the new guidance. This is consistent with our recommendation. In addition, while the Navy's policy is to terminate any contract quantities considered excess, item managers told us that they rejected several terminations because termination costs were too high. However, the item managers had no evidence that analyses were made to determine if this was the most economical action.

Regarding our matter for congressional consideration, DOD did not agree that the Navy is duplicating requirements. DOD stated that planned program requirements and related recurring demands are necessary to provide separate consumer- and wholesale-level requirements. Our analysis shows that the requirements are counted twice—once as planned program requirements (the consumer level to which DOD refers) and once in computing the reorder level requirement (DOD's wholesale level). The duplication results in buying more inventory than is needed and could ultimately lead to excess inventory. The example of the self-locking nut cited in this report demonstrates that the Navy can successfully reduce the duplication of requirements by relying on the reorder level requirement. Consistent with our past report, other duplicated requirements exist and correcting this situation will reduce or eliminate unnecessary spending.

As arranged with your office, we plan no further distribution of this report until 15 days from its issue date unless you publicly announce the report's contents earlier. At that time, we will send copies of this report to the appropriate congressional committees; the Secretaries of Defense and the Navy; and the Director, Office of Management and Budget.

⁸Contract Terminations at DOD Wholesale Inventory Control Activities (DOD Inspector General Audit Report No. 93-146, June 30, 1993).

Please contact me at (202) 512-8412 if you have any questions. Major contributors to this report are Charles Patton, James Murphy, Louis Modliszewski, and David Keefer.

A handwritten signature in black ink that reads "David R. Warren". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

David R. Warren, Director
Defense Management Issues

Scope and Methodology

We analyzed September 30, 1996, inventory stratification reports for overall data regarding Navy secondary inventory purchases. Stratification reports match on-hand and due-in inventory to requirements and are used for budgeting and reporting purposes. We did not validate the Navy's automated inventory database; however, we did note discrepancies that were revealed during our review of documents and discussions with item managers. Also, Naval Audit Service research completed in November 1997 showed that observed demand rates often did not agree with those recorded in inventory control point records. In collecting data on individual sample items, we used the same data the Navy uses for inventory management, reporting, and budgeting purposes.

We used the data to identify Navy inventory items that had inventory on contract or on purchase request that exceeded then-current requirements and economic order quantities. We identified 4,727 items that had \$102.4 million of inventory on contract that exceeded needs and 732 items with \$18.2 million of inventory on purchase requests that exceeded needs. Purchase requests are internal documents generated by item managers that inform contracting officers of the need to purchase an item. We focused our efforts on items that were on contract because they represented the bulk of the inventory being purchased that exceeded requirements and economic order quantities.

We judgmentally selected 200 items with about \$48 million of inventory on contract in excess of needs (67 items with \$6 million on contract managed at the Naval Inventory Control Point's Mechanicsburg, Pennsylvania, office and 133 items with \$42 million on contract managed at the Philadelphia, Pennsylvania, office). We selected items that had the highest values and quantities of inventory on order in excess of needs, as well as a cross section of the remaining items. The division of items between the two inventory control point offices was determined on the basis of the number and value of items that exceeded requirements and economic order quantities.

For the items, we analyzed data from the September 1996 inventory stratification reports. We also gathered and analyzed information and documents from item managers on requirement computations and efforts to cancel contracts that exceeded requirements and economic order quantities. We used the information and documents as a basis for follow-up questions and discussions with item managers. We also met with other inventory control point officials as needed to discuss various

subjects and concepts germane to overall Navy inventory management. We valued inventory items at the latest acquisition cost.

Although the review concentrated on the processes for determining inventory needs and canceling excess purchases, past reviews identified problems with on-hand and in-transit inventories. For example, in August 1996, we reported that the Navy's item managers did not have adequate visibility over \$5.7 billion in operating materials and supplies on board ships and at redistribution sites.¹ In June 1997, the Naval Audit Service reported that quantities of items actually in storage differed from accountable records for 21.7 percent of the items reviewed.² Also, in February 1998, we reported that DOD did not have visibility over all in-transit inventory.³

We performed our review between March 1997 and February 1998 in accordance with generally accepted government auditing standards.

¹Navy Financial Management: Improved Management of Operating Materials and Supplies Could Yield Significant Savings ([GAO/AIMD-96-94](#), Aug. 16, 1996).

²Fiscal Year 1996 Consolidating Financial Statements of the Department of the Navy Business Operations Fund, Naval Audit Service (No. 040-97, June 16, 1997).

³Department of Defense In-Transit Inventory ([GAO/NSIAD-98-80R](#), Feb. 27, 1998).

Comments From the Department of Defense

Note: GAO's comment supplementing those in the report text appear at the end of this appendix.



ACQUISITION AND
TECHNOLOGY

OFFICE OF THE UNDER SECRETARY OF DEFENSE

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WASHINGTON, DC 20301-3000

09 APR 1998

Mr. David R. Warren
Director, Defense Management Issues
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Warren:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, GAO Code 709249 "NAVY INVENTORY MANAGEMENT: Improvements Needed to Prevent Excess Purchases" (OSD Case 1565). The DoD partially concurs with the report.

The DoD agrees with the need for Navy to reiterate contract termination policy to Item Managers and the need complete the systems change allowing partial termination without additional Item Management reviews. The DoD does not agree with the GAO's contention that Navy is duplicating requirements through the use of planned program requirements and recurring demand. Each has a distinct use in properly supporting the customer. DOD also does not agree with the method the GAO recommends for Navy to compute requirements based on carcass returns. Navy's current method of computing a carcass return forecast combined with an Item Management review of recent requisition activity is an acceptable alternative for them to account for parts to be returned for repair.

The detailed DoD comments on the GAO draft report are provided in the enclosure. The Department appreciates the opportunity to review and comment on the draft report.

Sincerely,

Roy R. Willis
Acting Deputy Under Secretary
of Defense (Logistics)

Enclosure



GAO DRAFT REPORT DATED MARCH 13, 1998

(GAO CODE 709249) OSD CASE 1565

“NAVY INVENTORY MANAGEMENT: IMPROVEMENTS NEEDED TO PREVENT
EXCESS PURCHASES”

DEPARTMENT OF DEFENSE COMMENTS

* * * * *

GENERAL COMMENTS

Dollar Value Of Annual Purchases. GAO stated that the Navy annually purchases \$3.4 billion of inventory and has an on-hand inventory valued at \$18.3 billion.

DOD RESPONSE: Requires clarification. These dollar figures are for total Navy while the audit only addresses the purchases made at the Naval Inventory Control Point (NAVICP). The annual purchases at the NAVICP make up less than half of the \$3.4 billion total Navy dollar value (\$1.6 billion). Also, the Navy decreased its overall inventory from \$18.3B in FY96 to \$16.8B in FY97.

Selection of Items with Inventory Purchases Not Supported By Valid Needs. The GAO pointed out that their analysis of 200 judgmentally selected items showed that the Navy duplicates some inventory requirements, resulting in unnecessary purchases and inventory that exceeds needs. Also, inventory was purchased without specific requirements or on the basis of inaccurate demand forecasts.

DOD RESPONSE: Requires clarification. The GAO requested examples based on the information in the Item Manager Tool Kit, which is information such as inventory and requirements data at a given point in time. This information is unvalidated by an Item Manager. As such, the Item Manager Tool Kit may reflect a projected buy quantity at a point in time, based solely on systems data. In a perfect world this information would be exact at any single point in time. However, since we are in a time of constant change, one of the most important steps of the requirements determination process is the Item Manager’s review of the data to ensure accuracy. Many of the examples shown never resulted in a purchase request because the Item Manager corrected the data prior to initiating a purchase request. This correction of data was done as part of their daily review and not as part of this audit. The use of these examples causes the reader to misinterpret the process and results in an incorrect conclusion.

See comment 1.

MATTER FOR CONGRESSIONAL CONSIDERATION

GAO claims that its past report and current work have demonstrated that counting inventory requirements twice (once as planned requirements and again as part of the reorder level requirement) can result in major expenditures for unnecessary inventory purchases.

DOD RESPONSE: Nonconcur. The Department continues to disagree with the statement that requirements are being duplicated. The planned requirements are necessary to provide a consumer depot level maintenance requirement. Recurring demands are used to develop wholesale level requirement. Both are justified and authorized in accordance with DoD 4140.1R, DoD Materiel Management Regulation. Similarly, Navy has a consumer level of material on aircraft carriers, which is also supported by a wholesale level of inventory. The purpose of the planned requirements and recurring demand are explained separately below to show that both are needed to provide sufficient supply support, but do not result in overstated requirements.

The purpose of recurring demands discussed in the audit report are to develop a wholesale level requirement. Navy automated systems employ standard inventory theory concepts. The recurring demands are applied in forecasting techniques to determine an average quarterly demand. This average is then applied to procurement/repair leadtimes, order quantity and safety level with consideration of wearout and survival for reparable items. If the recurring demands were not registered, the wholesale requirement would be eliminated. This would cause the customer to wait a procurement leadtime for replenishment of consumer level requirements. The purpose of the planned requirements discussed by GAO is to identify a consumer depot level maintenance requirement. If these planned requirements were removed from the file, there would be no consumer level inventory to support daily operations. The planned requirements discussed by GAO are identified with a document identifier code of BPR.

RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Secretary of the Navy to strengthen management oversight procedures and internal controls over the processes for determining inventory requirements and canceling excess purchases. Specifically, GAO recommended that the Secretary of the Navy should improve the validity of requirements through the following actions: (1) updating depot demand forecasts in a timely manner, (2) implementing current Navy guidance for measuring the effectiveness of using planned program requirements to satisfy nonrecurring demands by matching customer requisitions with these requirements, (3) recording unserviceable parts to be returned for repair as due ins when computing requirements.

DOD RESPONSE: Partially concur with (1) Concur with (2) Nonconcur with (3).

- 1) Partially concur. DoD agrees that Navy depot demand forecast should be updated in a timely manner. However, DoD does not agree that Navy should adjust procurements based on one quarter of demand fluctuations. Navy currently updates forecasts based on information

received from the depots. These demands are reviewed when making buys to determine if actual observations justify the demand forecast. Many criteria such as changes in fleet needs, depot capacity, test cell availability, or funding availability make this process as dynamic as the parts being forecasted. If the forecast was adjusted with each monthly demand fluctuation, the Navy would buy, terminate, and buy again chasing a noise level in demand. The Naval Air Systems Command Engine "Motor Board" is one example where Navy Inventory Control Points meet with maintenance personnel on a quarterly basis to review funding and existing and emerging requirements and makes adjustments to the engine repair/overhaul schedules as necessary. This method has proven the most effective method of properly reacting to changes in demand data.

- 2) Concur. DoD agrees that Naval Supply Systems Command (NAVSUP) must provide detailed guidance to the NAVICP on measures of effectiveness for planned program requirements. The NAVICP will then develop and implement measurement tools to gain a better understand of what drives these requirements changes and how these changes affect their business. NAVSUP will provide this guidance to the NAVICP for an implementation by March 1999.
- 3) Nonconcur. Navy uses projected carcass returns (or projected return of broken parts) as part of the requirements computation process. Requirements for reparable are computed using only attrition demand, which is a quarterly forecasted demand less the quarterly forecasted regenerations. Taking into consideration the projected return of carcass returns is more timely than waiting for actual turn-ins based on a customer requisition. For this reason, the current method used by the Navy of computing a carcass return forecast combined with an Item Management review of recent requisition activity is an acceptable alternative to account for unserviceable parts to be returned for repair. Carcass return forecasts are updated as needed to reflect the most accurate data possible.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Secretary of the Navy to strengthen management oversight procedures and internal controls over the processes for determining inventory requirements and canceling excess purchases. Specifically, the Secretary of the Navy should improve the process for canceling contracts where items are excess to needs by directing the following: (1) eliminating one and two year protection levels when considering purchases for cancellation, (2) reemphasize to item managers that they have the responsibility and authority to direct cancellation of contracts, (3) requiring economic analyses to determine if it economical to cancel contracts for excess material, (4) automatically adjusting item manager cancellation recommendations when the recommended quantities exceed the quantities available to cancel.

DOD RESPONSE: Nonconcur with (1) and (3). Concur with (2) and (4).

- 1) Nonconcur. For material on Contract, Navy protects the greater of EOQ or 8 quarters attrition demand. There are three main reasons for this protection:
 - NAVICP has already invested substantial resources in getting a procurement on contract. Current administrative costs to place an item on contract are greater than \$1600.00.

- DODIG Audit Report on Contract Terminations at DOD Wholesale Inventory Control Activities (Report 93-146, Project No. 1LE-0067) placed the NAVICP costs to terminate at 6% of contract value.
- If there is no added protection level for items on contract there is potential to procure this material again in the near future due to even slight demand fluctuations, thus, creating churn in the procurement pipeline and incurring additional costs to buy, terminate, and buy again.

Navy has found through experience that in many cases small changes in stock position will cause immediate contract termination and cause and increase a condition the Navy terms "buy-terminate-buy." The protection level creates a "buffer zone" between the EOQ and the protection level for new buys, eliminating churn on the buy quantity as long as the total assets do not exceed requirements by more than the protection level quantity. The EOQ itself doesn't prevent fluctuations between buy and terminate positions. Additionally, any savings are merely those achieved by moving the buy out in time, weighed against the costs of processing the termination and initiating the same contract a second time within a relatively short period of time. For the vast majority of Navy reparable items, the eight quarter attrition demand plus the EOQ calculate to a quantity of one each. So, in effect, this protection level does not effect the termination decision for most items.

- 2) Concur. Current Navy policy gives the Inventory Manager the responsibility and authority to initiate all purchase request cancellations and contract terminations and to forward them to the procurement area for action. NAVICP policy is very aggressive in terminating excess material and this is clearly demonstrated in the DODIG AUDIT REPORT (93-146). Navy will reiterate contract termination policy and procedure with their Item Managers and Buyers within 90 days, clearly stating that Item Managers have the authority and responsibility to terminate a contract when their stock position warrants. Navy will also institute policy that a Buyer may not reject a termination without written concurrence from the Item Manager unless the material has shipped or the contract is already being terminated for default.
- 3) Nonconcur. DoD agrees with Navy's current policy to aggressively pursue the termination of all contracts that represent excess due-in over and above protection levels as is also recommended in subparagraph (2) above of the GAO's recommendation #2. Past Navy experience with an economic termination model showed that it did not achieve the intent of promoting the termination of unneeded material. Navy policy in this area is that any quantities in excess of the protection limit should be terminated regardless of the age of the contract. A 1993 internal Navy study indicated that there is no correlation between contract age and actual termination fees. As a result Navy does not use a model to exclude some contracts from possible termination.
- 4) Concur. The Navy already has a change in process to eliminate the potential for contract terminations to be rejected if the quantity is greater than what is available to terminate in the contract records. NAVICP-Mechanicsburg has already implemented a new version of Integrated Technical Item Management Procurement System (ITIMP) which provides the capability to receive transactions sent from Item Manager Toolkit for contract terminations. NAVICP-Philadelphia will be implementing this version in the first quarter 1999. This new version will eliminate the need to use the current system which creates a problem by sending error messages to the originating Item Manager when the input quantity to cancel does not

match the quantity remaining on the contract. Instead, the new version allows for partial terminations to take place without additional Item Manager reviews.

APPENDIX I SCOPE AND METHODOLOGY

GAO stated that discrepancies were noted in the automated inventory data base and that the Naval Audit Service research completed in November 1997 showed that observed demand rates often did not agree with those recorded in inventory control point records.

DOD RESPONSE: Requires clarification. As indicated in the exit brief between DoD and the GAO on March 2, 1998, NAVICP officials briefed the Naval Audit Service in July and August 1997. At this brief, NAVICP pointed out a demand recording problem resulting from the conversion of Naval Air Stations from end-use to Defense Working Capital Fund (DWCF) stock records and the corrective action being taken. In a letter dated September 3, 1997 to the Director, Naval Audit Service, the NAVICP requested a postponement of the demand recording audit since NAVICP operating procedures had undergone a major revision which adversely impacted the demand recording process. The Naval Audit Service advised by letter dated November 1997 that the demand recording topic should be reviewed during fiscal year 1999. The postponement will allow the automated system to stabilize, a sufficient amount of demand transaction history to build under normal operating procedures, and a reliable and representative universe of demand transactions to develop. This should result in a more comprehensive audit and efficient and effective use of audit resources.

The following is GAO's comment on the Department of Defense's (DOD) letter dated April 9, 1998.

GAO Comment

1. DOD stated that many of our examples never resulted in a purchase request because the item manager corrected the requirements data before initiating a request. For each of the 200 items we reviewed, there were inventory orders on contract and those amounts on contract exceeded requirements and economic order quantities as of September 30, 1996. Of the examples specifically cited in the report, only two examples discuss information that related to the initiation of a subsequent purchase request or contract. We used both examples to demonstrate how the Navy double counts planned program requirements—a matter that item managers would not review or take corrective action on.

Related GAO Products

Defense Inventory: Inadequate Controls Over Air Force Suspended Stocks ([GAO/NSIAD-98-29](#), Dec. 22, 1997).

High Risk Series: Defense Inventory Management ([GAO/HR-97-5](#), Feb. 1997).

Defense Logistics: Much of the Inventory Exceeds Current Needs ([GAO/NSIAD-97-71](#), Feb. 28, 1997).

Defense Inventory: Spare and Repair Parts Inventory Costs Can Be Reduced ([GAO/NSIAD-97-47](#), Jan. 17, 1997).

Defense Logistics: Requirement Determinations for Aviation Spare Parts Need to Be Improved ([GAO/NSIAD-96-70](#), Mar. 19, 1996).

Army Inventory: Budget Requests for Spare and Repair Parts Are Not Reliable ([GAO/NSIAD-96-3](#), Dec. 29, 1995).

Defense Inventory: Opportunities to Reduce Warehouse Space ([GAO/NSIAD-95-64](#), May 24, 1995).

Defense Supply: Inventories Contain Nonessential and Excessive Insurance Stocks ([GAO/NSIAD-95-1](#), Jan. 20, 1995).

Defense Supply: Acquisition Leadtime Requirements Can Be Significantly Reduced ([GAO/NSIAD-95-2](#), Dec. 20 1994).

Army Inventory: More Effective Review of Proposed Inventory Buys Could Reduce Unneeded Procurement ([GAO/NSIAD-94-130](#), June 2, 1994).

Air Force Logistics: Improved Backorder Validation Procedures Will Save Millions ([GAO/NSIAD-94-103](#), Apr. 20, 1994).

Air Force Logistics: Some Progress, but Further Efforts Needed to Terminate Excess Orders ([GAO/NSIAD-94-3](#), Oct. 13, 1993).

Navy Inventory: Better Controls Needed Over Planned Program Requirements ([GAO/NSIAD-93-151](#), July 1, 1993).

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