



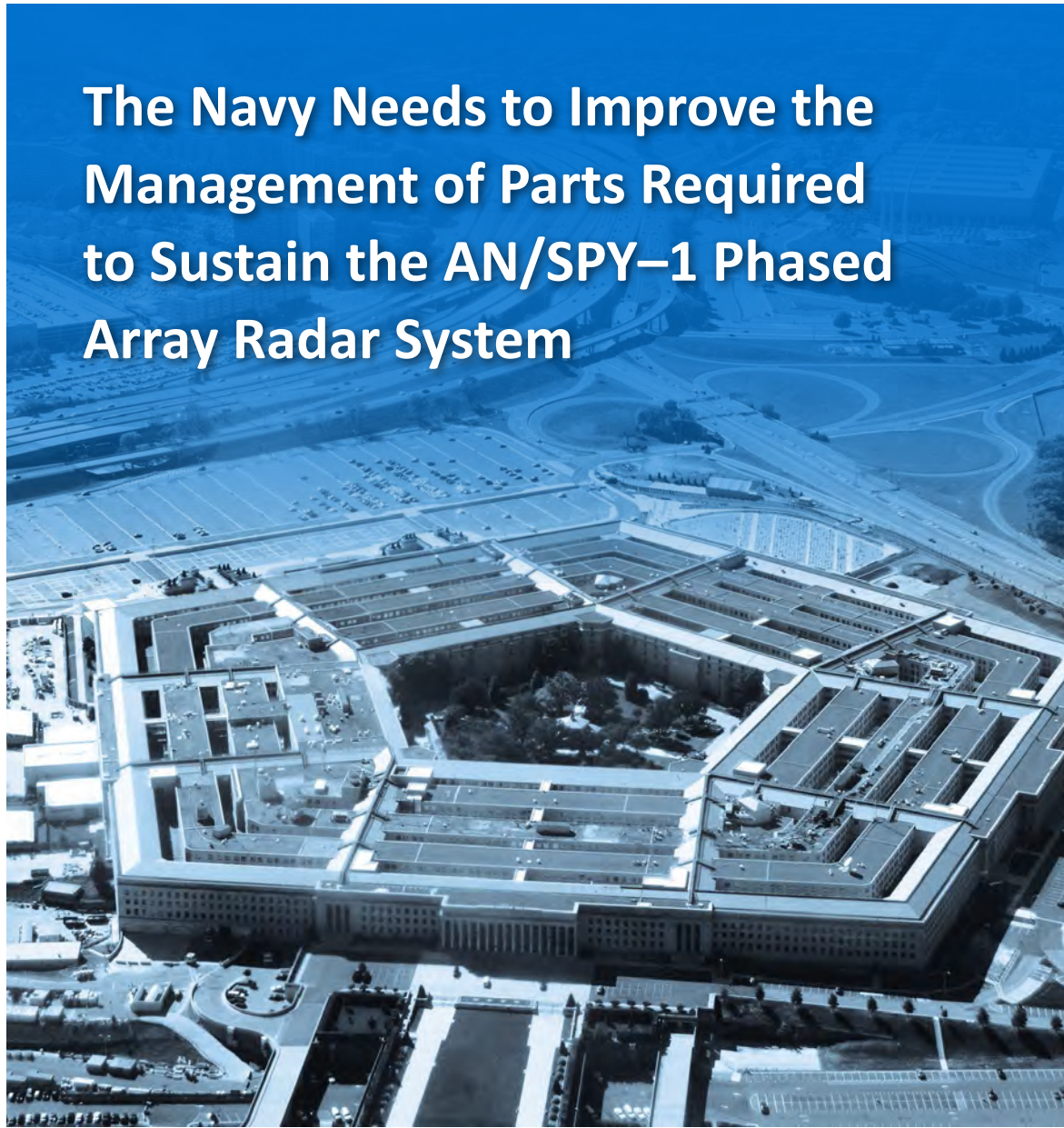
INSPECTOR GENERAL

U.S. Department of Defense

NOVEMBER 6, 2015



The Navy Needs to Improve the Management of Parts Required to Sustain the AN/SPY-1 Phased Array Radar System



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Results in Brief

The Navy Needs to Improve the Management of Parts Required to Sustain the AN/SPY-1 Phased Array Radar System

November 6, 2015

Objective

Our objective was to evaluate whether the Navy cost effectively managed material requirements for the AN/SPY-1 Phased Array (SPY-1) radar systems.

Finding

The Navy did not cost effectively manage spare-part requirements for the SPY-1 radar variants installed on the *Arleigh Burke*-class destroyers. Specifically, from October 2012 through September 2014, the Navy did not use 250 of 374 parts that it determined were critical, acquired 32 of 124 parts in excess of their authorized stock levels, and for 26 of 124 parts, the quantities were below the authorized levels.

This occurred because the Navy used ineffective forecasting methods to determine the type and quantity of parts needed to sustain the systems. In addition, the Navy did not adequately monitor and revise the authorized stock levels to more accurately reflect actual parts used.

As a result, the Navy purchased and stocked parts valued at \$71.8 million that were not needed. Of those stocked parts, the Navy could remove \$36.5 million worth of excess parts from the destroyers and put storage space to better use. In addition, the Navy could save \$59.6 million if it used excess parts that are not unique to SPY-1 radar to offset the procurement of other weapon system future part requirements, and the Navy may save additional cost by either reselling or disposing unneeded parts that

Finding (cont'd)

are unique to the SPY-1 radar. The Navy has potentially adversely impacted the destroyer's mission readiness, unless those parts can be readily obtained when needed from other sources.

Recommendations

We recommended the Commander, Naval Supply Systems Command, in coordination with the Commander, Naval Sea Systems Command, compare the authorized stock levels of forecasting models to the actual parts used and take appropriate action to determine future needs. After the action is taken, conduct annual reviews for parts identified by the forecasting models to ensure the authorized stock levels remain consistent with actual parts needs and report the results separately for each subsystem.

Among other recommendations the Type Commanders should monitor the authorized stock levels and submit a request for approval to revise the levels to reflect actual usage and require personnel to identify excess when they conduct annual inventories of parts and turn in all parts identified as excess. If the parts are determined no longer needed and cannot be used, dispose of the parts.

Management Comments and Our Response

The Assistant Secretary of the Navy for Research, Development and Acquisition addressed all specifics of Recommendations 1.a, 1.b, and 2.a and partially addressed those for Recommendation 2.b. In addition, as a result of management comments, we renumbered Recommendation 2.c. as 1.c. and redirected the recommendation to the Commander, Naval Supply System Command and Commander, Naval Sea System Command. Therefore, we request that the Commanders provide comments to this report by December 7, 2015. Please see the Recommendations Table on the back of this page.

Recommendations Table

Management	Recommendations Requiring Comment	No Additional Comments Required
Commander of Naval Sea System Command	1.c	1.a, 1.b
Commander of Naval Supply System Command	1.c	
Type Commander	2.b	2.a

Please provide Management Comments by December 7, 2015.



**INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
4800 MARK CENTER DRIVE
ALEXANDRIA, VIRGINIA 22350-1500**

November 6, 2015

**MEMORANDUM FOR UNDER SECRETARY OF DEFENSE ACQUISITION, TECHNOLOGY,
AND LOGISTICS
NAVAL INSPECTOR GENERAL**


**SUBJECT: The Navy Needs to Improve the Management of Parts Required to Sustain
the AN/SPY-1 Phased Array Radar System (Report No. DODIG-2016-011)**

We are providing this report for review and comment. The Navy did not cost effectively manage spare-part requirements for the SPY-1D and D(V) radar systems. We determined that ineffective management and forecasting methods led to inaccurate requirement determinations for SPY-1 radar parts, which resulted in quantities that exceeded and were below the authorized stock levels. We conducted this audit in accordance with generally accepted government auditing standards.

We considered management comments on a draft of this report when preparing the final report. DoD Instruction 7650.03 requires that recommendations be resolved promptly. Comments from the Assistant Secretary of the Navy for Research, Development and Acquisition addressed all the specifics of Recommendation 1.a, 1.b, and 2.a, and partially addressed those for Recommendation 2.b. Additionally, as a result of comments from the Assistant Secretary of the Navy for Research, Development and Acquisition, we renumbered Recommendation 2.c. as 1.c. and redirected it to the Commander of Naval Supply System Command and Commander, Naval Sea System Command. Therefore, we request the Commanders provide comments on the final report by December 7, 2015.

Please provide comments that conform to the requirements of DoD Instruction 7650.03. Please send a PDF file containing your comments to audapi@dodig.mil. Copies of your comments must have the actual signature of the authorizing official for your organization. We cannot accept the /Signed/ symbol in place of the actual signature. If you arrange to send classified comments electronically, you must send them over the SECRET Internet Protocol Router Network (SIPRNET).

We appreciate the courtesies extended to the staff. Please direct questions to me at (703) 604-9077 (DSN 664-9077).


Jacqueline L. Wiccarver
Assistant Inspector General
Acquisition, Parts, and Inventory

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Introduction

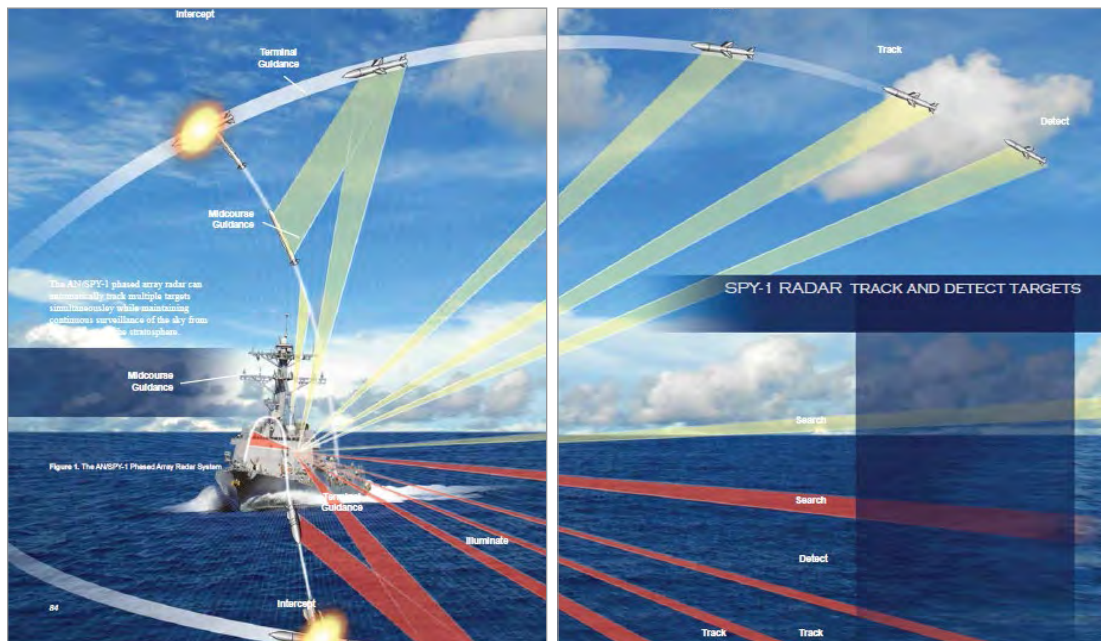
Objective

Our objective was to evaluate whether the Navy cost effectively managed material requirements for the AN/SPY-1 Phased Array (SPY-1) radar systems. This is the first in a series of audits related to the management of parts needed to sustain the SPY-1 radars. See Appendix A for a discussion of the scope and methodology related to the audit objective.

Background

According to Program documentation¹ and information obtained from the Congressional Research Service, the SPY-1 radar is an advanced, automatic detect and track radar system. It is the primary radar sensor for the Aegis Weapon System that searches, detects, and tracks air and surface targets. The SPY-1 radar supports both anti-air warfare and ballistic missile defense missions. The SPY-1 radar interfaces with the standard missile to receive status information, provides guidance information, and performs a post-intercept kill assessment. The Navy placed the first SPY-1 radar in operation in 1983 on *Ticonderoga*-class cruisers and *Arleigh Burke*-class destroyers in 1991. Figure 1 illustrates the SPY-1 radar's capabilities.

Figure 1. AN/SPY-1 Phased Array Radar System Capabilities



Source: NAVSEA Leading Edge, Volume 7, Issue No. 2

¹ AN/SPY-1D(V) Life Cycle Sustainment Plan, dated January 2012.

The Navy developed and installed different variants of the SPY-1 radar system on *Ticonderoga*-class cruisers and *Arleigh Burke*-class destroyers. Table 1 below shows the various SPY-1 radar systems and identifies the ships by hull number that each variant has been installed.

Table 1. SPY-1 Radar Variants and the Ships Installed

SPY variant	SPY-1A	SPY-1B	SPY-1B(V)	SPY-1D	SPY-1D(V)
Ship Class	<i>Ticonderoga</i>	<i>Ticonderoga</i>	<i>Ticonderoga</i>	<i>Arleigh Burke</i>	<i>Arleigh Burke</i>
Ship Hull Numbers	52-58	59-64	65-73	51-90	91-112*

* DDG 113 is under construction so we excluded the DDG from the table.

Source: Naval Supply Systems Command

We focused on the Navy’s management of the parts required to sustain the SPY-1D and D(V) radar variants installed on the *Arleigh Burke*-class destroyers.

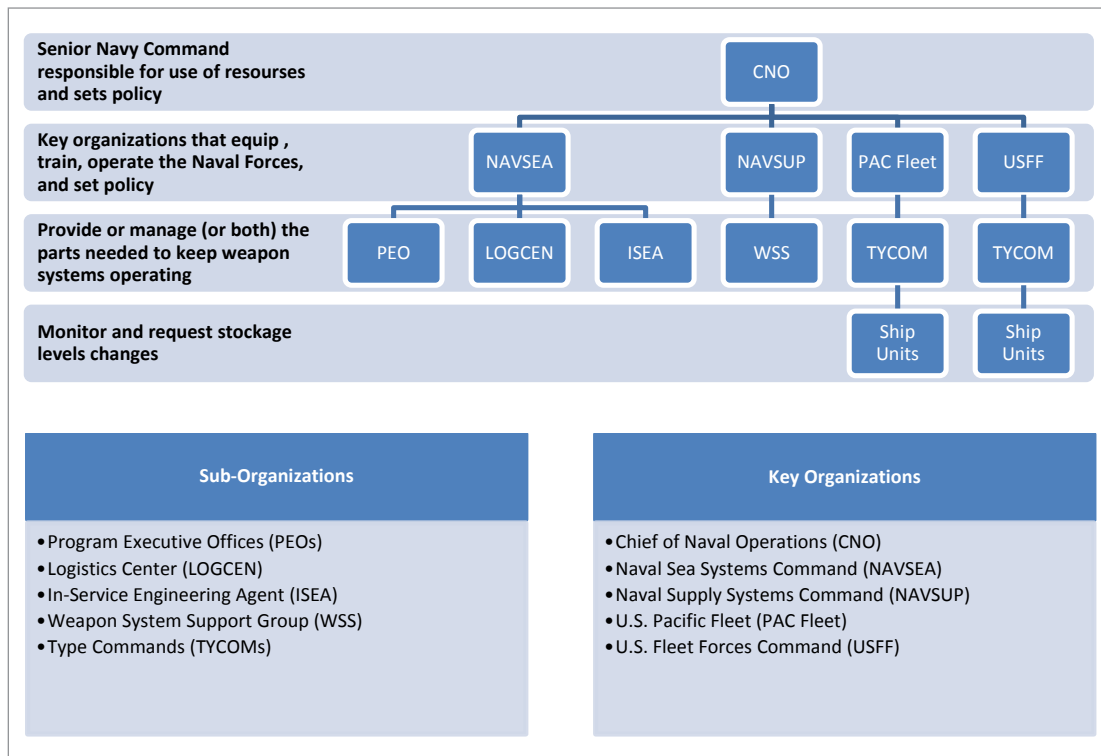
Arleigh Burke–Class Destroyers

Arleigh Burke-class destroyers were the Navy’s first ships built around the Aegis Weapon System. The *Arleigh Burke*-class destroyer is a warship that provides multi-mission offensive and defensive capabilities with the ability to operate independently as a carrier strike group, surface action group, amphibious ready group, and underway replenishment group. The Navy has 62 *Arleigh Burke*-class destroyers in active service as of the end of FY 2013 and 4 in production as of the end of FY 2014.

Navy Organizations

The Naval Sea Systems Command (NAVSEA), Naval Supply Systems Command (NAVSUP), and Operating Forces (known as the fleet) support Navy supply and report to the Chief of Naval Operations. Figure 2 illustrates the organizational structure that manages SPY-1 radar parts.

Figure 2. Organizations That Manage SPY-1 Radar Systems Parts



Source: DoD OIG

Naval Sea Systems Command

NAVSEA provides engineering, scientific, technical, logistical and product support to the Fleet. NAVSEA designs, builds, delivers, and maintains ships and systems. NAVSEA organizations include the Program Executive Offices (PEOs), In-Service Engineering Agent (ISEA), and Naval Sea Logistics Center (NAVSEALOGCEN).

PEOs:

- plan and execute in-service support;
- are responsible for surface ships acquisition that includes procuring the initial spares needed until NAVSUP assumes responsibility to supply the parts needed to support the radar; and
- oversee all aspects of life-cycle management of their assigned programs.

ISEAs:

- provide engineering support such as design alterations and modifications; technical; logistics management support for assigned weapon systems and subsystems; and
- review and approve the allowance change requests based on engineering knowledge of the equipment.

NAVSEALOGCEN:

- ensures each part listed is complete;
- identifies the parts needed to maintain the system or equipment required for the respective ship; and
- identifies, reviews, and tracks changes to each part list and coordinates with activities responsible for allowance discrepancies and provides assistance to correct discrepancies.

Naval Supply Systems Command Weapon System Support

NAVSUP WSS procures and supplies the parts, components, and assemblies that keep Navy forces mission ready. After a weapon system is fully developed and integrated into the fleet, NAVSUP WSS:

- assumes the role as the primary Program Support Inventory Control Point for a particular system and supports 2 of the 12 integrated product support elements (supply support and packaging, handling, storage and transportation);
- provides the fleet with parts through a multi-tiered retail system and wholesale inventory;
- manages parts inventory for ships, submarines and weapon systems, including support for hull, electrical, mechanical, and electrical components; and
- forecasts parts requirements for wholesale stock.

The fleet customers use Operations and Maintenance funding to purchase parts from NAVSUP WSS wholesale inventory. NAVSUP WSS wholesale system purchases spare parts with Navy Working Capital Funds, and then resell the parts to fleet customers.

Fleet

The U.S. Pacific Fleet and U.S. Fleet Forces Command (Atlantic) provide combat-ready ships to support U.S. national interests in different parts of the world. Both fleets have Type Commands (TYCOMs) that keep the ships mission ready.

TYCOMs:

- maintain parts at the authorized stock levels;²
- conduct parts inventories, including annual inventories, identify and report quantities over and under the authorized stock levels; and
- request parts be removed from the ships and either disposed or made available to other ships.

² Authorized stock levels are the numbers and types of parts that the ships are authorized to stock to maintain the SPY-1 radar.

Navy Spare Parts Management

The Navy process to manage spare parts begins when the manufacturer submits a parts list needed to support the Navy's weapon systems. Upon receipt of the list, the Navy determines and acquires the parts needed to support and maintain a particular system or end item for an initial period, not to exceed 2 years. NAVSEA determines which parts should be initially stocked onboard ships and in wholesale inventory. In addition, NAVSEA establishes the parts replenishment requirements and determines any special tooling and test and support equipment needed to support this effort. NAVSEA also identifies the consumable items, such as bulk material, that are needed to sustain a particular weapon system.

NAVSEA uses numerous tools, such as logistics support analysis; part failure and criticality analysis; reliability centered maintenance; and level of repair analysis, to help make these determinations. However, part substitutions and improvements have altered nearly all equipment from the time they entered service. Therefore, the user needs to continuously assess and update parts needs based on actual part usage.

Navy policy³ provides guidance to ships' personnel to monitor parts failures, operational tempo, mission assignments, and weapons' systems capabilities changes, when they submit allowance change requests for TYCOM approval to adjust stock levels. See Appendix B for a flowchart of the Navy parts management process.

SPY-1 Radar Repair Parts Requirements Determination

NAVSEA determined that 374 repairable parts were critical to sustain the SPY-1 radar system. NAVSEALOGCEN used the Readiness Based Sparing (RBS) forecasting model⁴ and determined that 324 of those parts were needed on board 62 *Arleigh Burke*-class destroyers. The RBS model used the following engineering and supply support assumptions to forecast the type of parts and quantities to support SPY-1 radars on the destroyers:

- the level of maintenance and repair needed;
- parts failure and replacement rate (usage experience);
- operating time;
- whether more than one part is installed and operating at the same time;
- the percentage of time parts that should be available when ordered;
- the time it takes for parts to arrive on the ship after ordered; and
- the cost of the parts.

³ The NAVSUP Publication 485 (P-485), "Naval Supply Procedures," October 21, 1997.

⁴ The RBS forecasting model is a requirements determination process that computes the levels of parts needed to support a specific weapon system's readiness goals at the least cost.

NAVSUP WSS used a demand-based model to determine the quantity of parts to hold in wholesale inventory and to fill requisitions to replace parts consumed on board the destroyers.

The DoD Plan to Address Excess Inventory

As required by the National Defense Authorization Act,⁵ DoD developed a comprehensive plan for improving its inventory management systems with the overall objective to reduce current inventory and minimize the potential for future excesses. Specifically, the plan set the goal to:

- improve forecasting and reduce or terminate orders to ensure the inventory accurately reflect actual needs;
- enhance the methods for determining the amount of inventory to retain; and
- ensure timely review and disposal of excess inventory.

Further, the plan established improved methods to invest resources and manage DoD's inventory. The plan required Military Departments to:

- improve the management of items that would not require a recurring need for extended periods unless there was justification for retention or disposition;
- develop metrics that tracked items and procedures to evaluate parts not used in over 5 years for potential reuse or disposal; and
- reduce the acquisition and storage of parts that were in excess of the requirements by the end of FY 2016.

Review of Internal Controls

DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013, requires DoD Components to establish a program to review, assess, and report on the effectiveness of their internal controls. We identified internal control weaknesses in the Navy's management of the material requirements for the SPY-1 radar system. Specifically, the Navy did not cost effectively manage spare-part requirements for the SPY-1 radar variants installed on the *Arleigh Burke*-class destroyers. Specifically, from October 2012 through September 2014, the Navy did not use 250 of 374 parts that it determined were critical to keep the SPY-1 radar system on board the destroyers operational.

⁵ Public Law 111-84, "National Defense Authorization Act for Fiscal Year 2010," Section 328, "Improvement of Inventory Management Practices," October 28, 2009.

Additionally, the Navy did not submit a requisition (order) for 92 of 250 spare parts in the last 5 years, which should have prompted the Navy to reassess its continued need to stock those parts. Further, 32 of 124 parts the Navy used during that period had quantities above the authorized stock levels and 26 had quantities below the authorized levels. We will provide a copy of this report to the senior official responsible for internal controls in the Office of the Chief of Naval Operations.

Finding

The Navy Needs to Improve the Management of Parts Required to Sustain the AN/SPY-1 Phased Array Radar System

The Navy did not cost effectively manage spare-part requirements for the SPY-1 radar variants installed on the *Arleigh Burke*-class destroyers. Specifically, from October 2012 through September 2014, the Navy did not use 250 of 374 parts that it determined were critical to keep the SPY-1 radar system on board the destroyers operational. The Navy did not submit a requisition (order) for 92 of 250 spare parts in the last 5 years, which should have prompted the Navy to reassess its continued need to stock those parts. In addition, 32 of 124 parts the Navy used during that period had quantities above the authorized stock levels and 26 had quantities below the authorized levels. This occurred because the Navy:

- used forecasting methods that did not effectively determine the type and quantity of parts needed to sustain the systems; and
- did not adequately monitor and revise the authorized stock levels to more accurately reflect actual parts used.

The Navy's ineffective forecasting and management practices negatively impacted stock levels for SPY-1 radar parts. Specifically, the Navy purchased and stocked 240 parts valued at \$71.8 million without a valid or supported need.⁶ However, the Navy could save \$59.6 million if it used 181 of the 240 excess parts that are not unique to SPY-1 radar to offset the procurement of other weapon system future part requirements. In addition, the Navy may save additional cost by either reselling or disposing the remaining 59 unneeded parts that are unique to the SPY-1 radar and putting the storage space to better use. Furthermore, the Navy did not purchase parts valued at \$15 million that it forecasted were required to enable the SPY-1 radar to achieve the Aegis Weapon System's operational availability requirements. The Navy has potentially adversely impacted the destroyers' mission readiness, unless those parts can be obtained when needed from other sources.

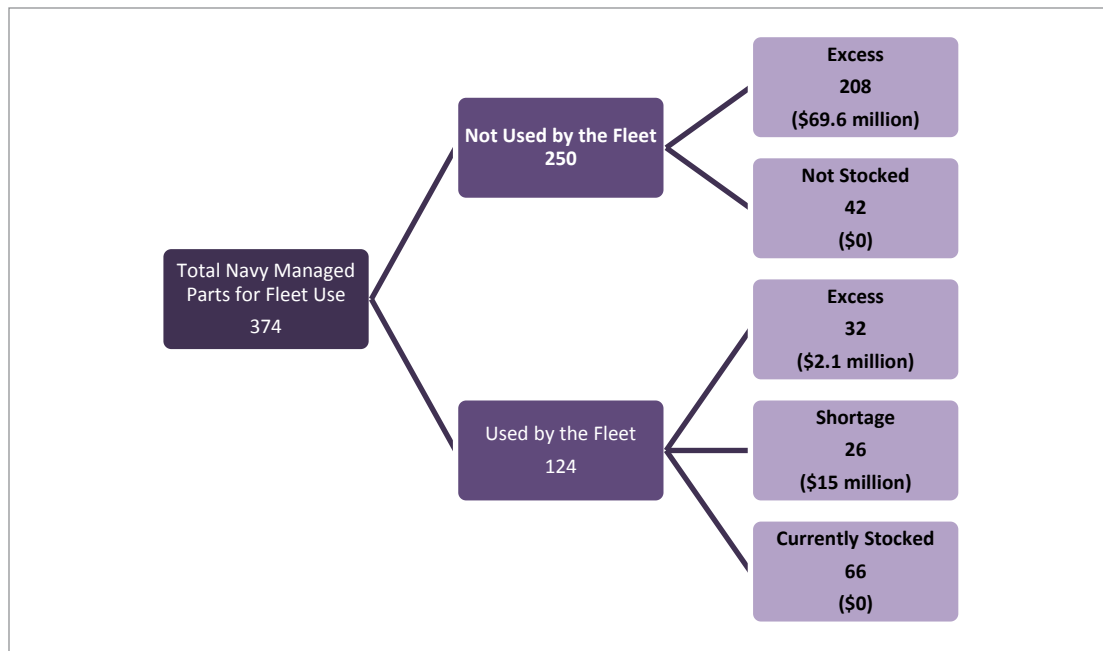
⁶ Parts valued at \$36.5 million used space on board destroyers that could be better used for other purposes.

Parts Needed Were Not Effectively Managed

The Navy did not cost effectively manage spare-part requirements for the various SPY-1 radar systems installed on *Arleigh Burke*-class destroyers. DoD guidance⁷ requires material managers to plan inventory to efficiently meet customer demand. It also requires the Navy to capture actual customer demand and usage at point of sale and, along with collaborative forecasting, use the demand and usage to update future demand forecasts for each echelon of supply where feasible.

During the initial establishment of SPY-1 radar parts, the Navy determined that 374 parts were needed for radar sustainment support. The Navy also determined at which level (onboard the destroyers or at the Navy depots) the parts should be stocked.⁸ However, fleet customers did not use a significant number of the parts to maintain the radar, as shown in Figure 3 below. In addition, the inventory levels for a large number of parts the fleet used either exceeded or were below the authorized requirement. The parts with no demand were considered excess because the Navy did not justify the continued need for stocking these parts.

Figure 3. Fleet Use of 374 Parts for the SPY-1 Radar



Source: Navy requisitions data

⁷ DoD Manual 4140.01, "DoD Supply Chain Materiel Management Procedures: Demand and Supply Planning," Volume 2, February 10, 2014, replaced DoD 4140.1-R, which was the governing DoD policy for a significant portion of the period reviewed this audit. The revised manual did not contain significant changes to the forecasting process.

⁸ 45 parts on board the destroyers, 52 parts in the Navy depots, and 230 parts at both locations. In addition, the Navy did not stock 47 of the parts it determined were critical to maintaining the operational availability of the SPY-1 radar.

Unneeded Parts

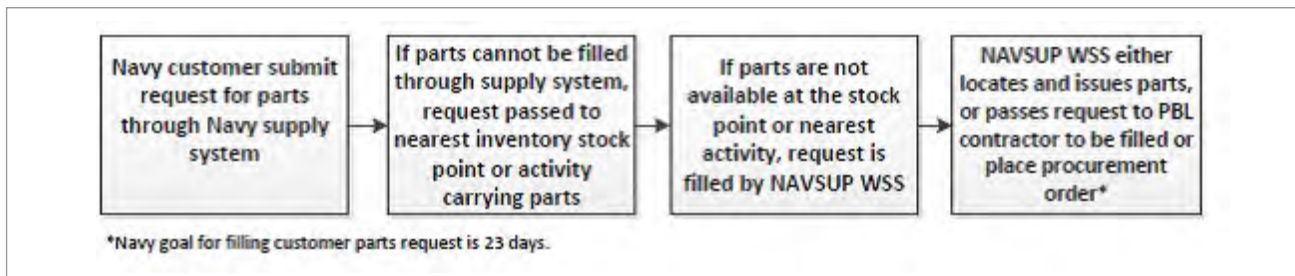
From October 2012 through September 2014, we found that the Navy did not use 250 of 374 parts, valued at \$69.6 million, that it determined were critical to keep the SPY-1 radars operational on board the destroyers. Specifically, 208⁹ of the 250 parts were considered excess and 42 parts were not stocked. According to the DoD policy,¹⁰ DoD Components should not stock items unless there is a future need. Also, Navy guidance¹¹ states that wholesale items that have not been used in 5 years indicate unnecessary inventory, and the Navy should revalidate the stock requirement.

We found that the Navy did not requisition 92 of 250 parts, valued at \$13.8 million, in the last 5 years. Additionally, the Navy did not follow procedures or assess whether those parts could be potentially reused or disposed. See Appendix C for a list of the parts that were not used to sustain the SPY-1 radars.

Parts Inventory Not Maintained at Authorized Levels

The Navy did not effectively manage inventory for 58 of 124 critical repairable parts the fleet used to maintain SPY-1 radars. Specifically, the Navy maintained excess inventory for 32 parts and had an on-hand shortage of 26 other parts that were below the authorized stock level. Figure 4 shows the Navy's process to fill customer parts requests.

Figure 4. Navy Requisition Process



Source: NAVSEA In-Service Ship Requisition Process

Navy policy¹² requires ships to stock critical repairable parts on a one-for-one reorder basis. Therefore, the ships should not stock parts that exceed or are below the authorized stock levels. When replacement parts were consumed or needed, Navy customers requested them through the Navy supply system. The Navy supply system's goal is to fill all parts requests within 23 days.

⁹ 42 parts on board the destroyers, 36 parts in the Navy depots, and 130 parts at both locations.

¹⁰ DoD Regulation 4140.1-R, "Supply Chain Materiel Management Regulation," May 23, 2003.

¹¹ NAVSUPINST 4500.13A, "Retention and Reutilization of Material Assets," October 1, 2013.

¹² Chief of Naval Operations Instruction (OPNAV) Instruction 4400.9C, "Depot Level Repairable Management," October 27, 2008.

For 32 parts, the Navy's inventory management system showed a quantity of 1,059 parts was available for fleet customers. However, the fleet authorized stock level for those parts were only 966. Therefore, the Navy had 93 parts, valued at about \$2.1 million that exceeded the authorized stock level. For example, the fleet was authorized to stock a radio frequency detector¹³ part, valued at \$85,388, on board *Arleigh Burke*-class destroyers. The authorized stock level for all the destroyers combined was 24 Radio Frequency Detectors; however, the destroyers had 36 parts on hand in which 12 were excess with a value of \$1.02 million. See Appendix D for a list of the parts with excess quantities.

The Navy had a shortage of 26 parts based on the authorized stock level. We found that 12 parts were not available at the nearest stock point or activity and had to be ordered when requested by fleet personnel. In addition, the Navy was not able to fill nine of those parts ordered from fleet customers within the

...the Navy was not able to fill nine of those parts ordered from fleet customers within the Navy's 23-day supply support goal.

Navy's 23-day supply support goal.¹⁴ For example, the fleet was authorized to stock a power inverter¹⁵ part, valued at \$99,827, on board *Arleigh Burke*-class destroyers.

The Navy authorized the fleet to maintain 107 power inverters to support SPY-1 radar operations. However, the Navy's inventory management system showed it had only 48 on hand. The Navy averaged 65 days to fill the orders it received for the power inverters. See Appendix E for a list of parts below the authorized stock level.

Navy's Forecasting Methods Need Improvement

The Navy used forecasting methods that did not effectively determine the type and quantity of parts needed to sustain the SPY-1 radar systems on board *Arleigh Burke*-class destroyers. The Navy used the RBS forecasting model and identified 374 repair parts were critical to sustain the SPY-1 radar systems. It also determined how many of those parts needed to be on board the 62 destroyers and in the Navy depots.

However, the Navy did not requisition 250 of those parts from October 2012 through September 2014. According to Navy personnel, parts failed faster than the RBS model predicted, and the destroyers were deployed more frequently and for longer time periods. Therefore, the Navy ran out of parts and could not maintain the 90-percent operational availability. Consequently, on October 1, 2012, the Navy increased the readiness goal from 90 to 97.5 percent. While this increase addressed parts availability to sustain the SPY-1 radar, it also caused the *Arleigh Burke*-class destroyers to overstock parts and did not consider the parts not used.

¹³ Part number 013343887.

¹⁴ The Navy Supply goal measures the average time it takes for a customer to receive a part after it is ordered.

¹⁵ Part number 014657498.

In addition, according to NAVSUP WSS personnel, the Navy used 5 years of historical usage data, as well as engineering estimates and assumptions, to forecast projected part usage for the parts being stored at the Navy depots. Some parts were in the supply system longer than other parts and had data available on historic use. NAVSUP WSS used engineering estimates to forecast the quantities for those parts that did not have historical usage data available. However, inaccuracies in the estimates resulted in the forecasted demand of five parts to be higher than actual usage. The five parts had a forecasted quantity of 3,333 parts over a two year period. We found only 1,534 requisitions were received, which resulted in NAVSUP WSS overestimating the amount of parts needed for its wholesale inventory. For example, NAVSUP WSS forecasted that fleet customers would need 3,017 electron tubes¹⁶ valued at a standard price of \$3,113 each; however, the fleet requisitioned 1,463 tubes to sustain the SPY-1 radars.

The Navy should reassess its forecasting assumptions and compare the models' forecasted parts stock levels to actual parts usage and revalidate the SPY-1 radar's part requirements.

Navy Needs to Review and Update Authorized Stock Levels

Navy officials did not adequately monitor, review, and revise the authorized stock levels to accurately reflect the actual parts used. The stock levels were managed through the Navy's Relational Supply (RSupply) system and Force Inventory Management Analysis Reporting System (FIMARS)¹⁷ that provided the fleet visibility of the quantity of parts in inventory.

Annual Assessments Were Not Adequate

Navy instruction¹⁸ states that RBS is an ongoing process and should be reviewed at least annually over the life of the weapon system. As part of the review, when performance is below designated goals, the component should assess and identify problems. Specifically, when the achieved operational availability differs significantly from the readiness thresholds established and the initial assessment reveals no major solutions, the assumptions should be reassessed.

¹⁶ Part number 013926982.

¹⁷ Force Inventory Management Analysis Reporting System is an automated system that provides the capability to maintain Total Asset Visibility for onshore and offshore fleet sites.

¹⁸ Chief of Naval Operations Instruction (OPNAVINST) 4442.5A, "Readiness Based Sparing," August 15, 2011.

The Navy assessed the RBS model outputs in February 2013. However, Navy personnel stated that the review was conducted Aegis Weapon System-wide, not at the weapon system's subsystem or part level. Consequently, the

Navy's review did not identify the 250 critical SPY-1 radar repair parts that were not used...

Navy's review only evaluated whether the Aegis Weapon System achieved the Navy's operational availability goal as a whole and was not designed to identify specific parts with excess and shortage inventory. Therefore, the Navy's review did not identify the 250 critical SPY-1 radar repair parts that were not used and did not effectively maintain the inventory for 58 of 124 parts that were actually used.

Revision Request to Adjust Stock Levels Not Submitted

Navy supply publication¹⁹ requires the fleet to recognize and promptly request revisions for onboard stock levels when the need for a part has increased or decreased. To update the shipboard allowance for repairable parts, the fleet or TYCOM must submit a change request to the NAVSUP WSS for approval.

The RSupply system and FIMARS provides the fleet with visibility of inventory maintained on each of the 62 *Arleigh Burke*-class destroyers, which could be used to assess whether the authorized stock level need to be revised. FIMARS is the Navy's Total Asset Visibility for onshore and offshore fleet sites. FIMARS maintains information on the stock levels for authorized parts and inventory on hand at the depots and on each ship. The FIMARS interfaces with the RSupply system. The fleet used the RSupply system to manage the inventory of parts on each destroyer.

However, the fleet did not take advantage of this capability to address excess, shortages, and unused parts. According to fleet personnel, about 80 percent of the parts on *Arleigh Burke*-class destroyers were not used and could be moved to another location. However, the fleet had not submitted a revision request in 5 years to NAVSUP WSS for approval to adjust the authorized stock levels for the parts we identified that were in excess or shortage. In addition, neither NAVSUP WSS nor the fleet could provide an explanation for why no requests were made.

We reviewed Naval Surface Force Atlantic Fleet annual inventory reviews for five *Arleigh Burke*-class destroyers and found that the reviews were too narrowly focused and incomplete. The reviews only assessed onboard and due-in part quantities and did not identify the excess parts for wholesale turn in or disposal. On June 1, 2015, fleet personnel clarified the annual inventory reviews were used

¹⁹ The NAVSUP Publication 485 (P-485), "Naval Supply Procedures," October 21, 1997.

to capture the on-hand quantities of inventory, which was then entered into the RSupply system. After the information was entered into the RSupply system, the system compared authorized stock levels to on-hand quantities to identify excess inventory.

The fleet should have used this capability to identify excess inventory and revise stock levels. If excess parts are removed from the destroyers, the Navy could put that space to better use. In addition, 181 of the 240 excess parts shown in Appendixes C and D were not unique to the SPY-1 radar and can be used to support other weapon systems. Therefore, the Navy could save \$59.6²⁰ million if it used the 181 excess parts that are not unique to the SPY-1 radar to offset the procurement of other weapon system future part requirements. In addition, Navy may save additional cost by either reselling or disposing the remaining 59 unneeded parts that are unique to the SPY-1 radar.

The Navy should require personnel on board *Arleigh Burke*-class destroyers to use the information from the annual inventory reviews, in conjunction with information identified in the FIMARS database to justify whether parts are still needed. In addition, if fleet personnel determine that parts are needed, they should submit a request for approval to revise the authorized stock levels. In addition, the Navy should use any excess parts to offset the future procurement of SPY-1 radar or other weapon system part requirements or dispose of the unneeded parts.

Conclusion

The Navy's ineffective forecasting and management practices negatively impacted the stock levels of SPY-1 radar parts. The forecasting methods used did not adequately identify the parts needed to sustain the SPY-1 radar. Specifically, the Navy forecasting methods did not identify the right parts and quantities needed. As a result, inventory levels exceeded or were below the authorized stock levels. Also, Navy did not follow its policies to assess and adjust the stock levels for authorized inventory to more accurately reflect actual parts used. As a result, the Navy unnecessarily accumulated and stored SPY-1 radar critical parts, valued at \$71.8 million, that was not needed to support the system's readiness objectives. If excess parts are removed from the destroyers, the Navy could put that space and funds to better use. Furthermore, the Navy did not to purchase other parts, valued at \$15 million that were needed to keep the SPY-1 radars operating. The failure to purchase the correct parts could result in a threat to the *Arleigh Burke*-class destroyers' mission readiness and safety.

²⁰ This reflects the total dollar value for those parts that are not unique to the SPY-1 radar as shown in "Appendix C - Table C-1. On-Hand Parts That Were Not Used" and "Appendix D - Parts Stocked That Exceeded Authorized Levels."

Management Comments on the Finding and Our Response

The Assistant Secretary of the Navy (Research, Development and Acquisition) provided comments on the Finding and on the draft report in a comment resolution matrix. We have addressed the areas identified in the matrix and made minor changes to the report, where appropriate.

Navy Comments on RBS Parts Requirements Determination

Comments 1 and 7: The Assistant Secretary commented that the report states that 250 of 374 critical parts were not used within a 2-year period, which concluded this was ineffective. The Assistant Secretary stated that the conclusion failed to understand the intent of RBS methodology. The Assistant Secretary stated that an RBS-modeled system is used to achieve and sustain Office of Chief of Naval Operations (OPNAV) readiness goals and meet an operational availability. By design, the RBS model uses an OPNAV approved operational availability requirement to identify and stock the material critical to maintaining the weapons system readiness. Parts are stocked on ship primarily for their contribution to readiness as opposed to guaranteed or forecasted demand.

Our Response

We understand that the Navy's RBS model primarily stocks parts based on contribution to readiness and not solely on forecasted demand. We considered this in our report; however, Navy guidance²¹ requires consumer (shipboard) inventory levels be tailored to meet established goals for weapon system support. Those levels may consist of readiness-based, demand-based, limited-demand and nondemand-based items. Material managers, with other acquisition and logistics managers, are required to evaluate supply support approaches and requirements determination methods and select the most cost effective supply support concept.

While the Navy guidance recognizes the RBS methodology can result in improved supply support, it also states that RBS methods should be complemented with other analytical techniques, such as simulation modeling techniques capable of assessing RBS results using fleet experience data. It also requires systems that have their part requirements determined using RBS to have their operational availability monitored annually. Other than the October 2012 one-time increase that the Navy made to the SPY-1 radar operational availability requirement to address parts shortages, the Navy provided no evidence that it monitored and periodically updated the model's assumptions and revised the SPY-1 part requirements and stock levels, based on fleet experience data.

²¹ OPNAV Instruction 4441.12D, "Retail Supply Support of Naval Activities and Operating Forces," April 12, 2012, and OPNAV Instruction 4442.5A, "Readiness Based Sparing," August 15, 2011.

Navy Comments on Unneeded Parts

Comments 1, 2, and 8: The Assistant Secretary stated that the report recommends all nondemand material be considered as excess and offloaded, and cites several monetary figures of savings or instances where the Navy should not have procured material because there was no valid need. The Assistant Secretary stated the recommendations and assertions contained in the draft report are predicated upon the concept that “demand or usage” equates to “need.” The Assistant Secretary asserted that the assumption was fundamentally flawed since the SPY-1 repair parts were determined by the RBS model and not a demand-based modeled system and many of these items are stocked due to their contribution to readiness goals. The Assistant Secretary stated that DoD Regulation 4140.1R, which established the requirement that items not be stocked unless there is a need, has been superseded by DoDM 4140.01. The new regulation provides for “stocked insurance” items which are essential items. If failure or loss occurs, through accident, abnormal equipment or system failure, or other unexpected occurrences, the lead time required to obtain a replacement would seriously hamper the operational capability of a critical facility or weapon system. The Assistant Secretary stated that the Chief of Naval Operations directed increase in the operational availability goal for the AEGIS Weapon System drove an increase in insurance-type items for the SPY-1 radar.

Our Response

We did not recommend that all material that Fleet had not ordered during the period reviewed be considered excess and offloaded. However, we questioned how effectively the Navy managed SPY-1 radar part requirements. The Navy did not use 250 parts that it determined were critical to keep the SPY-1 radars operationally available. As noted in the report, the Navy did not stock any inventory for 42 of those parts or submit an order for 92 other parts in the last 5 years. The Navy increased SPY-1 radar parts to address shortages once. However, the Navy did not provide evidence that it monitored and periodically updated the RBS model assumptions based on fleet experience data. While the updated guidance allows for parts to be stocked as insurance items (at the wholesale level) based on their criticality to a weapon system’s readiness, those items still must have a valid future need. Although some of the parts may have been stocked originally based on its criticality, the Navy did not track or monitor the logistics support performance for the SPY-1 radar. In addition, Navy did not use that data to periodically refresh the RBS output. Therefore, the Navy cannot support that all parts lacking demand over the timeframe reviewed by the audit are being stored for insurance purposes.

Navy Comments on Fleet Parts in Excess of Authorized Levels

Comments 5 and 10: The Assistant Secretary acknowledged the fleet had material on the destroyers over and above the allowance levels. However, he stated the excess was a small percentage and attributed it to changes in shipboard allowance due to configuration changes or updated allowance requirements. The Assistant Secretary stated that the fleet maintained a 100-percent, on-hand or on-order policy for stocked shipboard repair parts during the analysis window, and it was unclear if the audit team considered on-order assets. The Assistant Secretary also stated the parts were visible through FIMARS and available to be moved by the TYCOMs to satisfy demand throughout the fleet. In accordance with TYCOM guidance, the excess material will be offloaded and redistributed, disposed of, or moved to Real-Time Reutilization Asset Management for storage and reuse.

Our Response

During our audit, we considered the fleet's 100-percent, on-hand or on-order policy for stocked shipboard repair parts. However, OPNAVINST 4400.9C, requires the fleet to maintain repair parts on a one-for-one exchange basis. Therefore, the fleet should not have more than the authorized quantity of parts in inventory. For that reason, we concluded the Navy maintained excess inventory for the 32 SPY-1 parts with on-hand quantities above their authorized allowance levels.

Navy Comments on Making Adjustments to Authorized Stock Levels

Comment 6: The Assistant Secretary stated that our interpretation of Navy guidance on adjusting stock levels was not accurate. The Assistant Secretary stated the Navy already has processes in place to revise stock levels. Authorized stock levels for repairable material were determined by OPNAV-approved models at NAVSUP and NAVSEA and any changes are made by those activities through the Automated Shore Interface processing. Ship Commanding Officers can also initiate changes through Allowance Change Requests-Fixed for repairables, but, typically, these are for minor changes. Recommending decreases to repairable allowances (authorized stock levels) due to lack of demand should not be initiated by the ships through an Allowance Change Request but be part of the RBS review process.

Our Response

We are aware that there are different methods available to the Navy to revise stock levels, such as the Automated Shore Interface process. However, NAVSUP personnel explained that this process can take some time to catch up and actually adjust the allowance levels. In addition, as evidenced by the discrepancies between on hand quantities and authorized levels the Automated Shore Interface process is not working effectively. The Fleet was maintaining inventory for 58 parts

on the destroyers that was over and under the approved stock levels. While the differences we identified varied, Navy guidance requires that allowance list changes requests be submitted when material failure rates are significantly greater or less than initially estimated, conditions require a different level of support, or mission assignments require additional parts.

In addition, while some parts that lack demand may need to be stocked as insurance items because the previous RBS reviews identified that those parts were so critical to the SPY-1 radar's required operational availability, we found that the Navy was not stocking any inventory for 42 of the 250 parts with no demand. We determined that NAVSUP and NAVSEA did not use SPY-1 radar logistics support performance data to validate authorized stock levels through the RBS review process as required. As a result, the Navy does not know whether the current parts and associated authorized stock levels are appropriate. Therefore, the fleet should have submitted Allowance Change Requests and obtained appropriate approval if the fleet's inventory parts were necessary.

Navy Comments on Potential Savings Resulting from Turn in of Excess Parts

Comments 3 and 9: The Assistant Secretary stated the potential savings resulting from the turn in of parts is overstated. The Assistant Secretary stated that while 181 of the 240 identified excess parts may have applicability in other weapon systems, they were stocked aboard for readiness criteria and may or may not be needed for other systems/applications. Therefore, the Assistant Secretary stated the \$59.6 million in potential savings related to those parts was overstated. In addition, the Assistant Secretary stated the report's use of the standard price when discussing cost avoidance or savings was not correct. The Assistant Secretary stated that although the parts were procured using the standard price, cost avoidance or savings stemming from the turn in of "excesses" should be calculated using net price, which was generally a much lower number.

Our Response

We do not agree with the rationale the Assistant Secretary used to conclude savings are overstated. Using net price to calculate savings is inappropriate. Net price is what the fleet would pay if it were exchanging a part needing repair for a replacement. The excess parts we identified were available for immediate use and they did not need to be repaired. Consequently, using the cost to acquire the part is the appropriate method to calculate savings because the Government would have to purchase the part for another user at a future date.

If the existing inventory for the 181 excess parts that were not unique to the SPY-1 radar were used to offset other weapon system future part requirements instead of acquiring new parts, which is consistent with DoD policy, then \$59.6 million could be saved. Additional savings could be realized if the Navy either resells or disposes the inventory associated with the 59 other unneeded parts that are unique to the SPY-1 radar.

Navy Comments on Report Mixing End Use or Fleet Owned Material with Navy Working Capital Fund Procedures

Comment 4: The Assistant Secretary stated the report mixes end use or fleet owned material with Navy Working Capital Fund procedures. For example, The Assistant Secretary stated the report references NAVSUPINST 4500.13A when discussing shipboard end use or fleet owned material, but this instruction is used for Navy Working Capital Fund material that does not apply.

Our Response

We identified problems with Navy management of inventory maintained by the fleet and Navy Working Capital Fund. To address the Assistant Secretary's comment, we made minor changes to the section of the report discussing Navy's guidance for Working Capital Fund stocking requirements by more clearly distinguishing which inventory level (wholesale and retail) we are discussing.

Assistant Secretary of Defense (Logistics and Material Readiness) Comments on the Finding and Our Response

The Assistant Secretary of Defense (Logistics and Material Readiness) also provided the following comments on the Finding.

Logistics and Material Readiness Comments on Navy Shipboard Inventory Management Policy

The Assistant Secretary of Defense (Logistics and Material Readiness) stated that the Finding did not reflect Navy policy for stocking parts. The Assistant Secretary stated the key finding was that the Navy determined the critical SPY-1 radar parts requirements and then did not use the items within a 2-year period. The Assistant Secretary stated the Navy RBS model primarily stocks parts based on their contribution to readiness and not on forecasted demand and items were included (as insurance items) based on the risk to readiness of not having the item onboard. Therefore, parts usage over a specific time frame was not an adequate measure of shipboard allowancing effectiveness.

Our Response

We disagree. The Finding was that the Navy did not effectively manage part requirements for the SPY-1 radar. Navy guidance²² requires that shipboard inventory levels be tailored to meet established weapon system support goals. According to that guidance, those levels may consist of readiness-based, demand-based, limited-demand, and no demand-based items. Navy guidance²³ recognizes that improved supply support can result when using RBS methodology, and it should be complemented with other analytical techniques, such as simulation modeling capable of assessing RBS results using fleet experience data. Navy guidance further requires systems whose part requirements are determined using RBS to have actual supply, maintenance, and other integrated logistics support products monitored against operational availability requirements and, when a significant difference exists, RBS should be re-performed.

Logistics and Material Readiness Comments on Applicability of DoD's Supply Chain Material Management Manual and Comprehensive Inventory Management Plan

The Assistant Secretary of Defense (Logistics and Material Readiness) stated that DoD Manual 4140.01 and the Comprehensive Inventory Management Plan referenced in the report only apply to wholesale inventory, not shipboard retail stocks held for issue.

Our Response

DoD Manual 4140.01 implements the policies established in DoD Instruction 4140.01.²⁴ The Manual establishes the procedures for DoD supply chain material management processes, including demand and supply planning at the retail level. Specifically, Volume 2 of the Manual prescribes policies to manage retail inventory and states that DoD Components will use retail demand-based or RBS computations to minimize the parts on order and in storage in the DoD supply chain.

The Comprehensive Inventory Management Improvement Plan was developed to guide DoD's collective effort to improve inventory management and fulfill the Section 328 of the National Defense Authorization Act for Fiscal Year 2010. The overall objectives of the plan are to reduce excess inventory without degrading material support to the customer. The plan does not specify which inventory level (wholesale or retail) that it applies to and refers to both levels throughout.

²² OPNAV Instruction 4441.12D, "Retail Supply Support of Naval Activities and Operating Forces," April 12, 2012.

²³ OPNAV Instruction 4442.5A, "Readiness Based Sparing," August 15, 2011.

²⁴ DoD Instruction 4140.01, "DoD Supply Chain Management Policy," December 14, 2011.

Recommendations, Management Comments, and Our Responses

Redirected Recommendation

As a result of the Assistant Secretary of the Navy for Research, Development and Acquisition comments to a draft of this report, we renumbered Recommendation 2.c. as 1.c. and redirected it from the Type Commander to the Commander, Naval Supply System Command and Commander, Naval Sea System Command, who have the authority to implement the recommendation.

Recommendation 1

We recommend that the Commander of Naval Supply Systems Command, in coordination with the Commander of Naval Sea Systems Command:

- a. Reassess its forecasting assumptions and compare the models' forecasted parts stock levels to the actual parts used and revalidate the SPY-1 radar's part requirements.**
- b. After Recommendation 1.a is implemented, at minimum, conduct annual reviews for parts identified by the forecasting models to ensure that the authorized stock levels remain consistent with actual part needs and report the results separately for each subsystem.**
- c. Use any excess parts identified through the implementation of Recommendation 2.b. to offset the future procurement of SPY-1 radar or other weapon system part requirements. If the parts are determined no longer needed and cannot be used to support the SPY-1 radar or another weapon system, dispose of the parts.**

Assistant Secretary of the Navy for Research, Development and Acquisition Comments

The Assistant Secretary of the Navy for Research, Development and Acquisition neither agreed nor disagreed. He acknowledged the recommendation to reassess the AN/SPY-1 Radar forecasting assumptions but reiterated the validity of the Navy's current RBS model. The Assistant Secretary stated that the Navy would continue to collaborate with all stakeholders to improve sustainment and ensure readiness objectives are met. He further stated that NAVSUP would coordinate with NAVSEA, the AEGIS AN/SPY-1 Radar Program Office, and the fleet to ensure that an annual review of repair parts is conducted to evaluate stock levels. He also stated that NAVSUP will continue ongoing assessments of wholesale demand

forecast performance to support existing semi-annual inventory management reviews. Finally, he stated that the Type Commanders were not the authority or responsible organization to reallocate or dispose of excess inventory and that Recommendation 2.c should be redirected to NAVSEA and NAVSUP.

Our Response

Comments from the Assistant Secretary addressed the specifics of Recommendations 1.a and 1.b, and no further comments are required. We request that the Commander, Naval Supply System Command and Commander, Naval Sea System Command provide comments on the final report to Recommendation 1.c which was redirected to them as requested by Assistant Secretary of the Navy for Research, Development and Acquisition.

Recommendation 2

We recommend that the Type Commander:

- a. Monitor the authorized stock level on board *Arleigh Burke*-class destroyers and submit a request for approval to revise the authorized stock levels to reflect actual use.**
- b. Require personnel on board *Arleigh Burke*-class destroyers to identify excess inventory when they conduct annual inventories of parts and turn in all parts identified as excess.**

Assistant Secretary of the Navy for Research, Development and Acquisition Comments

The Assistant Secretary of the Navy for Research, Development and Acquisition stated that monitoring and reporting excess stock were already incorporated into current fleet practices.

Our Response

Comments from the Assistant Secretary did not address these Recommendations. We found that the Type Commanders were not identifying excess inventory when conducting annual inventories of parts and submitting requests to NAVSEA and NAVSUP for the reallocation or disposal of excess inventory. Specifically, the Fleet annual inventories only assessed onboard and due-in parts and did not identify excess parts for turn in and disposal. We request that the Type Commander provide comments on the final report outlining specific actions the Fleet will take to identify and turn in excess inventory when conducting annual inventories.

Appendix A

Scope and Methodology

We conducted this performance audit from July 2014 through July 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence, to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We reviewed the Navy's processes and procedures used to determine the type and quantity of parts to stock on ships and at the wholesale facilities. We obtained a list of all systems on *Arleigh Burke*-class destroyers and the cost per system. From this list, we selected the AN/SPY-1D and D(V) Phased Array Radar systems, as they represented the two highest cost systems. We then requested a list of parts for both radar systems. Navy personnel provided a list of 374 parts for both systems that were managed by the Navy. For the 374 parts, we obtained:

- inventory data from July 2013 through September 2014 and analyzed the data to determine whether the 62 DDGs stocked parts exceeded or were below the authorized stock levels;
- requisitions data from October 2012 through September 2014 and analyzed the data to determine whether the ships ordered (used) or did not order (not used) the parts within last 2 years;
- 5-year use data from October 2009 through September 2014 and analyzed the data to determine how often the parts were used in the last 5 years; and
- requisitions data from October 2012 through September 2014 and analyzed the data to determine whether the destroyers received the orders within the 23 days required.

We reviewed the following processes and procedures to evaluate whether the Navy:

- monitored part output and use identified through the RBS forecasting model and determined the action needed to align parts with the initial authorized stock level;
- effectively determined the quantity of parts needed to fill requisitions and maintain stock levels at the wholesale facilities; and
- submitted a request to revise the authorized stock levels on ships and at wholesale facilities.

We visited:

- Naval Supply Systems Command (NAVSUP), Weapon Systems Support (WSS) and Naval Sea Systems Command (NAVSEA), Logistics Center (NAVSEALOGCEN), Mechanicsburg, Pennsylvania;
- Type Command (TYCOM), U.S. Fleet Forces Command (USFF), U.S. Atlantic Fleet, Norfolk, Virginia; and
- Naval Sea Systems Command (NAVSEA) Program Executive Office (PEO) and Integrated Warfare System (IWS), Washington, D.C.

During the site visits, we discussed Navy officials' roles and responsibilities to manage SPY-1 radar parts. For the TYCOM, we reviewed inventory data for parts stocked on the ship. We conducted a physical inventory to verify that the quantity of parts stocked on the ship matched the quantity of parts in the inventory management system.

To understand roles and responsibilities for parts management, we interviewed personnel from:

- Type Command (TYCOM), U.S. Pacific Fleet Command (COMPACFLEET);
- Naval Supply Systems Command (NAVSUP), Weapon Systems Support (WSS);
- Naval Sea Systems Command (NAVSEA), Logistics Center (NAVSEALOGCEN); and
- Naval Surface Warfare Center, Port Hueneme Division (NSWC PHD), In-Service Engineering Agent (ISEA).

We reviewed:

- DoD Instruction 4140.01, "DoD Supply Chain Materiel Management Policy," December 14, 2011;
- DoD 4140-R, "Supply Chain Materiel Management Regulation," May 2003;
- Department of Defense (DoD) Manual 4140.01, "DoD Supply Chain Materiel Management Procedures," February 10, 2014;
- Chief of Naval Operations (OPNAV) Instruction 4400.9C, "Depot Repairable Item Management," October 27, 2008;
- OPNAV Instruction 4441.12D, "Retail Supply Support of Naval Activities and Operating Forces," April 12, 2012;
- NAVSUP Publication 485, Volume I, "Afloat Supply," October 21, 1997;
- OPNAV Instruction 4442.5A, "Readiness Based Sparing," August 15, 2011;
- NAVSUP Instruction 4400.96, "Responsibilities of the Navy Program Support Inventory Control Point (PSICP)," October 4, 1994.

Use of Computer-Processed Data

We relied on computer-processed data obtained from the Navy Force Inventory Management Analysis Reporting System (FIMARS) and Birdtrack systems.

The FIMARS application is a data repository and reporting system that tracks authorized stock levels and the quantities of parts stocked on *Arleigh Burke*-class destroyers. FIMARS data comes from the RSupply system installed on the destroyers. The data automatically uploads from the RSupply system without any changes or calculations to the data. The Navy used FIMARS to perform standard queries to determine the quantities of parts stocked on the destroyers and manage inventory.

The FIMARS data included the 374 SPY-1 radar Navy managed parts and quantities authorized for stock on *Arleigh Burke*-class destroyers. FIMARS reports the parts inventory on the destroyers at a point in time and updated based on the latest reported data. We used FIMARS data to determine whether the destroyers stocked parts that exceeded or were below the authorized stock level.

The Birdtrack is an automated application that provided the Navy with parts tracking and analysis capabilities to speed up the flow of replacement parts to *Arleigh Burke*-class destroyers. This application listed the requisitions submitted to NAVSUP by part for each destroyer and the time it took to obtain that part, referred to as the Average Customer Wait Time. We used the data to determine whether the parts took longer than the Navy's goal of 23 days to arrive after they were ordered by the personnel on the destroyers.

To verify the reliability of the FIMARS data, we checked the FIMARS data fields for missing data, examined the data for duplicates, and checked for other inconsistencies such as text data in numeric data fields. We also compared FIMARS allowance data to information in the RSupply system, which provided real-time inventory management data. We obtained the Smart Allowance Computational History File that showed the allowance history of the parts and reconciled the differences between the on-hand quantities in FIMARS and the RSupply system. We also selected seven *Arleigh Burke*-class destroyers and conducted a physical inventory of parts on each ship to verify the RSupply system.

To verify the reliability of the Birdtrack data, we recalculated the average customer wait time and verified its accuracy. We obtained the archived requisition and receiving information from NAVSUP and compared it to the data maintained in the Birdtrack system.

Based on our reviews, we concluded that the data used from the FIMARS, RSupply, and Birdtrack were sufficiently reliable for the purposes of this report.

Prior Coverage

During the last 5 years, the Government Accountability Office (GAO) and the Department of Defense Inspector General (DoD IG) issued five reports discussing the management of Navy's spare part inventory and the inventory management practices of the military departments. Unrestricted GAO reports can be accessed at <http://www.gao.gov>. Unrestricted DoD IG reports can be accessed at <http://www.dodig.mil/pubs/index.cfm>.

GAO

GAO-11-569, "DOD Needs to Take Additional Actions to Address Challenges in Supply Chain Management," July 28, 2011

GAO Report GAO-11-240R, "Comprehensive Inventory Management Improvement Plan Addressed Statutory Requirements, But Faces Implementation Challenges," January 7, 2011

DoDIG

DODIG-2014-064, "Improved Management Needed for the F/A-18 Engine Performance-Based Logistics Contracts," April 25, 2014

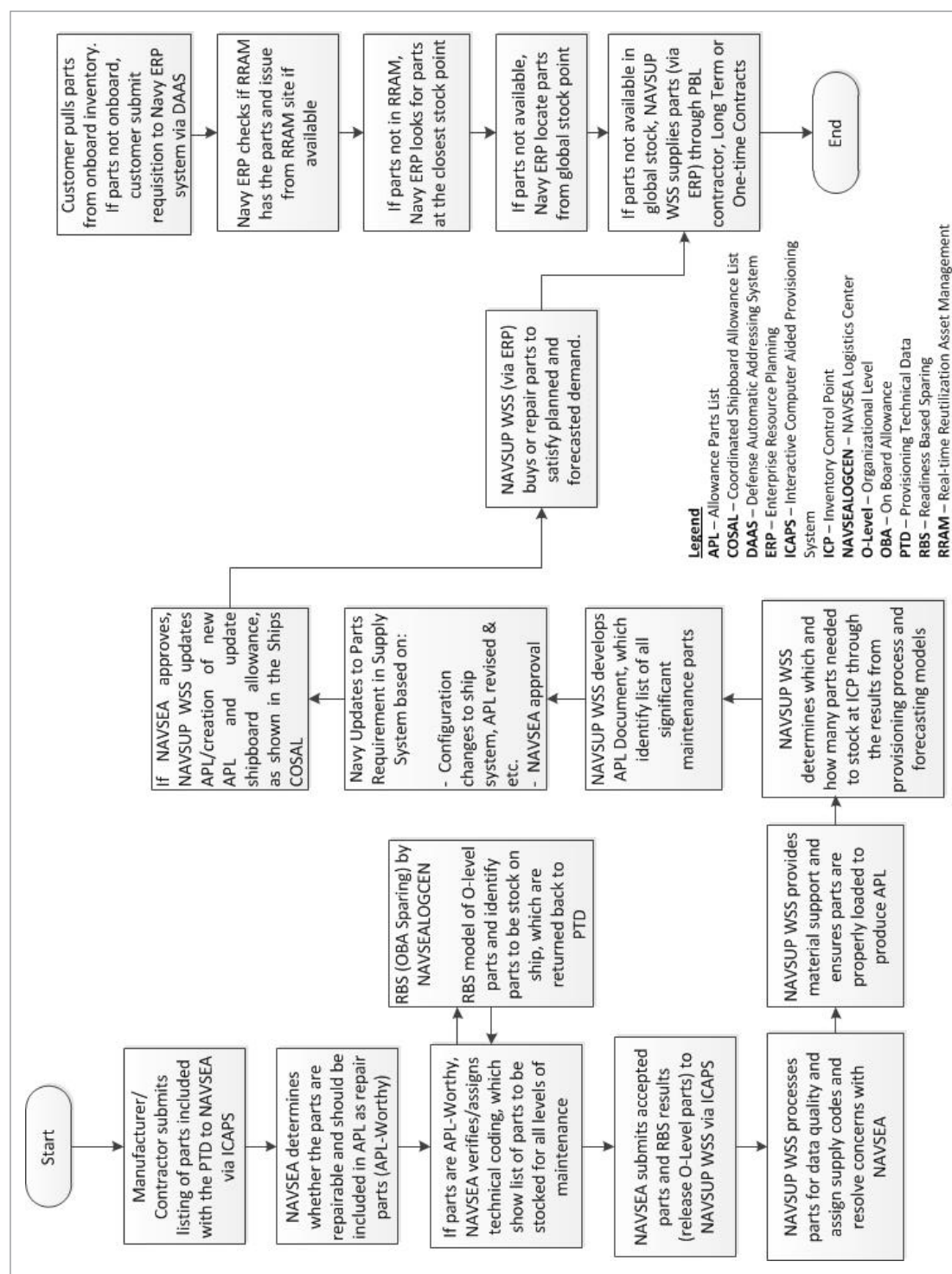
DODIG-2013-025, "Accountability Was Missing for Government Property Procured on the Army's Services Contract for Logistics Support of Stryker Vehicles," November 30, 2012

Report No. D-2011-061, "Excess Inventory and Contract Pricing Problems Jeopardize the Army Contract With Boeing to Support the Corpus Christi Army Depot," May 3, 2011

Appendix B

Spare-Part Inventory Management Process Flowchart

Figure B. Spare-Part Inventory Management Process Flowchart



Source: DoD OIG

Appendix C

On-Hand Parts That Were Not Used

Table C-1. On-Hand Parts That Were Not Used

No.	Part Number	SPY-1 Unique (Yes/No)	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Used
1	011603301	No	\$9,542	14	18	\$171,756
2	012551697	Yes	4,082	0	2	8,164
3	012559077	Yes	4,832	40	46	222,272
4	012559231	Yes	4,088	0	9	36,792
5	012559672	Yes	3,390	39	35	118,650
6	012559754	No	4,504	11	25	112,600
7	012559851	No	12,874	33	49	630,826
8	012568650	No	4,633	10	19	88,027
9	012568674	No	4,709	12	21	98,889
10	012568677	No	4,633	11	16	74,128
11	012568683	No	4,633	8	17	78,761
12	012583653	Yes	9,129	0	2	18,258
13	012583666	No	9,129	5	23	209,967
14	012583804	Yes	9,129	0	3	27,387
15	012583805	Yes	10,059	0	2	20,118
16	012583887	Yes	4,088	2	9	36,792
17	012584144	No	12,874	8	34	437,716
18	012584219	No	17,564	25	32	562,048
19	012584248	No	16,364	9	24	392,736
20	012584260	No	14,951	12	22	328,922
21	012584265	No	18,074	12	16	289,184
22	012584279	No	16,364	9	16	261,824
23	012584284	No	17,030	19	27	459,810
24	012584285	No	23,480	48	67	1,573,160
25	012584286	No	14,951	10	25	373,775
26	012584287	No	18,074	10	18	325,332
27	012584290	No	14,951	10	27	403,677
28	012584291	No	14,951	10	22	328,922

Table C-1. On-Hand Parts That Were Not Used (cont'd)

No.	Part Number	SPY-1 Unique (Yes/No)	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Used
29	012584292	No	14,951	10	21	313,971
30	012584295	No	17,030	19	33	561,990
31	012592785	No	17,030	19	28	476,840
32	012592800	No	16,364	34	48	785,472
33	012592802	No	14,951	33	55	822,305
34	012592820	No	16,364	0	20	327,280
35	012592821	No	17,564	19	29	509,356
36	012592822	No	17,564	19	45	790,380
37	012592823	No	14,951	10	33	493,383
38	012604233	No	17,030	19	25	425,750
39	012604234	No	16,364	8	20	327,280
40	012604256	Yes	3,615	40	46	166,290
41	012604257	Yes	4,504	0	16	72,064
42	012604284	No	17,030	19	25	425,750
43	012604295	No	17,564	11	22	386,408
44	012615757	No	2,726	0	5	13,630
45	012615763	No	17,030	11	16	272,480
46	012615765	No	18,230	20	37	674,510
47	012615778	Yes	4,511	2	15	67,665
48	012615809	No	17,564	20	30	526,920
49	012615810	No	16,364	64	66	1,080,024
50	012635228	No	18,074	12	17	307,258
51	012635233	No	17,564	9	22	386,408
52	012635236	No	14,951	10	25	373,775
53	012635237	No	17,564	11	24	421,536
54	012635241	No	17,030	30	42	715,260
55	012635246	No	17,564	11	29	509,356
56	012635251	No	17,564	12	24	421,536
57	012635252	No	18,074	21	26	469,924
58	012660626	Yes	12,582	0	7	88,074
59	012813199	Yes	35,314	2	3	105,942
60	013047161	Yes	9,919	0	1	9,919

Table C-1. On-Hand Parts That Were Not Used (cont'd)

No.	Part Number	SPY-1 Unique (Yes/No)	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Used
61	013097651	Yes	9,929	0	2	19,858
62	013172345	No	4,972	2	3	14,916
63	013190196	Yes	5,874	40	45	264,330
64	013190197	Yes	5,874	0	3	17,622
65	013190198	Yes	5,874	40	48	281,952
66	013203278	No	5,391	9	19	102,429
67	013892804	No	13,967	7	13	181,571
68	014134745	No	14,951	10	21	313,971
69	014382617	Yes	4,088	0	7	28,616
70	014657507	No	4,504	43	51	229,704
71	014693060	No	11,603	39	42	487,326
72	014693212	Yes	16,439	39	47	772,633
73	014743810	No	6,857	0	2	13,714
74	014828375	Yes	10,591	12	13	137,683
75	014851438	No	8,520	2	3	25,560
76	014851439	No	7,682	1	2	15,364
77	014851440	No	25,825	0	1	25,825
78	014851441	No	15,406	2	2	30,812
79	014872175	Yes	100,401	56	58	5,823,258
80	014872194	No	4,504	2	4	18,016
81	014872196	No	5,911	2	4	23,644
82	014872198	No	4,504	2	5	22,520
83	014872230	No	3,535	2	4	14,140
84	014872282	Yes	9,387	0	3	28,161
85	014951268	Yes	8,436	0	1	8,436
86	014951270	No	15,406	2	2	30,812
87	014951271	No	4,926	2	2	9,852
88	014951284	No	6,955	2	3	20,865
89	014951285	No	7,094	2	2	14,188
90	014951310	Yes	7,389	0	4	29,556
91	014951311	No	8,410	2	3	25,230
92	014951315	No	9,471	2	2	18,942

Table C-1. On-Hand Parts That Were Not Used (cont'd)

No.	Part Number	SPY-1 Unique (Yes/No)	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Used
93	014951323	No	5,391	2	4	21,564
94	014951333	No	15,793	2	4	63,172
95	014951336	No	4,926	2	2	9,852
96	014951342	No	5,230	2	2	10,460
97	014951349	No	4,514	2	4	18,056
98	014951351	No	18,387	2	4	73,548
99	014951358	No	8,410	2	2	16,820
100	014951361	Yes	5,504	0	1	5,504
101	014951675	No	9,388	2	3	28,164
102	014951678	No	8,128	2	4	32,512
103	014951681	No	8,410	2	2	16,820
104	014951684	No	4,504	2	2	9,008
105	014951688	No	4,504	2	2	9,008
106	014951691	No	8,410	2	2	16,820
107	014951705	No	4,504	2	2	9,008
108	014951708	No	7,558	2	1	7,558
109	014951723	No	5,391	2	3	16,173
110	014951773	No	40,487	2	3	121,461
111	014951829	No	8,410	2	5	42,050
112	014951834	No	10,537	2	3	31,611
113	014952272	No	15,406	2	2	30,812
114	014952279	No	5,192	2	4	20,768
115	014952312	Yes	5,381	0	1	5,381
116	014952335	No	9,388	2	1	9,388
117	014952340	No	19,918	2	3	59,754
118	014952352	No	4,504	2	2	9,008
119	014952356	No	8,410	2	2	16,820
120	014952358	Yes	7,389	0	1	7,389
121	014952542	No	4,504	2	2	9,008
122	014953546	No	4,819	2	7	33,733
123	014953547	No	6,087	2	2	12,174
124	014953548	No	4,504	2	2	9,008

Table C-1. On-Hand Parts That Were Not Used (cont'd)

No.	Part Number	SPY-1 Unique (Yes/No)	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Used
125	014953549	No	9,333	2	2	18,666
126	014953777	No	5,284	2	8	42,272
127	014971823	Yes	80,406	0	2	160,812
128	014997172	Yes	271,627	22	55	14,939,485
129	015026208	No	55,238	2	3	165,714
130	015026330	No	76,549	2	7	535,843
131	015026608	No	90,026	2	3	270,078
132	015028235	Yes	53,468	0	1	53,468
133	015028239	Yes	2,884	10	16	46,144
134	015028242	Yes	4,944	3	1	4,944
135	015028243	No	117,781	2	2	235,562
136	015028244	Yes	17,093	0	8	136,744
137	015028245	No	84,311	2	3	252,933
138	015028246	No	109,016	2	5	545,080
139	015028247	No	139,120	2	5	695,600
140	015028248	No	164,892	2	4	659,568
141	015028249	Yes	183,475	0	1	183,475
142	015028250	No	199,199	2	2	398,398
143	015028251	No	199,710	2	6	1,198,260
144	015028252	No	230,751	2	6	1,384,506
145	015028254	No	195,249	2	4	780,996
146	015028255	No	137,645	2	2	275,290
147	015028256	No	110,603	2	3	331,809
148	015028257	Yes	214,525	0	2	429,050
149	015030155	Yes	28,392	0	4	113,568
150	015030692	No	153,364	2	8	1,226,912
151	015030750	Yes	489,668	0	1	489,668
152	015031501	Yes	23,256	0	6	139,536
153	015047832	Yes	16,439	11	20	328,780
154	015047836	No	29,817	2	5	149,085
155	015047841	No	21,684	4	6	130,104
156	015047856	Yes	23,197	22	31	719,107

Table C-1. On-Hand Parts That Were Not Used (cont'd)

No.	Part Number	SPY-1 Unique (Yes/No)	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Used
157	015049782	No	34,521	26	28	966,588
158	015049859	No	51,099	2	2	102,198
159	015049863	Yes	17,972	12	12	215,664
160	015049901	No	36,898	15	15	553,470
161	015050187	No	16,364	2	3	49,092
162	015050257	No	22,134	2	2	44,268
163	015050272	No	122,174	2	8	977,392
164	015050275	Yes	55,690	19	21	1,169,490
165	015050345	No	64,277	2	2	128,554
166	015050382	No	8,077	2	3	24,231
167	015050643	No	29,951	2	4	119,804
168	015050645	No	35,719	2	3	107,157
169	015050843	No	22,980	2	3	68,940
170	015050847	No	32,942	4	6	197,652
171	015050849	No	31,559	2	3	94,677
172	015050852	No	41,197	4	4	164,788
173	015050853	No	38,177	1	4	152,708
174	015050861	No	32,947	14	15	494,205
175	015050867	No	26,239	2	3	78,717
176	015050869	No	27,563	4	5	137,815
177	015050897	No	22,567	2	3	67,701
178	015050902	No	8,925	2	2	17,850
179	015050905	No	13,995	2	3	41,985
180	015050906	No	38,918	2	2	77,836
181	015050908	No	40,811	2	3	122,433
182	015050909	No	50,109	4	5	250,545
183	015050913	No	26,949	2	3	80,847
184	015052029	No	26,049	2	3	78,147
185	015052335	No	34,249	4	6	205,494
186	015052339	No	21,040	2	4	84,160
187	015052365	No	20,340	2	3	61,020
188	015052368	No	19,322	2	2	38,644

Table C-1. On-Hand Parts That Were Not Used (cont'd)

No.	Part Number	SPY-1 Unique (Yes/No)	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Used
189	015057701	Yes	4,033	0	1	4,033
190	015057716	Yes	10,059	0	2	20,118
191	015058047	Yes	9,321	9	10	93,210
192	015059968	Yes	61,165	0	1	61,165
193	015060427	Yes	9,874	0	3	29,622
194	015060465	Yes	20,791	0	1	20,791
195	015060550	Yes	10,785	0	2	21,570
196	015060551	Yes	56,938	0	1	56,938
197	015060553	Yes	9,093	0	1	9,093
198	015217667	No	4,972	4	4	19,888
199	015251180	Yes	91,815	0	2	183,630
200	015302011	Yes	4,376	0	1	4,376
201	015434609	Yes	21,179	0	1	21,179
202	015456631	No	145,572	2	3	436,716
203	015489907	No	519,626	2	6	3,117,756
204	015672328	No	38,016	2	16	608,256
205	015873806	No	8,335	2	4	33,340
206	015873822	No	8,285	2	2	16,570
207	016260604	No	4,676	2	2	9,352
208	016260609	No	3,279	2	2	6,558
Total						\$69,642,837

Note: 153 of 208 Part Numbers valued at \$41.6 million are not unique to the SPY-1 radar. To determine the value of parts not used, we multiplied the standard price by the quantity on hand for each part.

Parts Forecasted but Not Stocked

Table C-2. Parts Forecasted but Not Stocked

No.	Part Number	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Stocked
1	012583550	\$21,330	0	0	\$–
2	012623980	892	0	0	–
3	012623981	892	0	0	–
4	012623982	892	0	0	–
5	012647727	197,756	0	0	–
6	012833422	25,825	0	0	–
7	012833423	25,825	0	0	–
8	012833424	25,825	0	0	–
9	013046870	9,310	0	0	–
10	014391381	91,815	0	0	–
11	014531949	10,409	0	0	–
12	014531951	25,825	0	0	–
13	014543879	25,825	0	0	–
14	014651501	11,614	0	0	–
15	014851437	20,230	0	0	–
16	014851445	14,917	0	0	–
17	014872276	46,096	0	0	–
18	014951677	25,825	0	0	–
19	014952480	4,504	0	0	–
20	014972626	188,527	3	0	–
21	015028237	50,835	0	0	–
22	015029110	10,940	0	0	–
23	015030150	165	0	0	–
24	015050857	14,440	0	0	–
25	015057648	5,006	0	0	–
26	015058020	10,548	0	0	–
27	015058037	15,959	0	0	–
28	015058740	21,179	0	0	–
29	015059999	446,226	0	0	–
30	015060023	9,987	0	0	–

Table C-2. Parts Forecasted but Not Stocked (cont'd)

No.	Part Number	Standard Price	Quantity Authorized	Quantity On Hand	Value of Parts Not Stocked
31	015060155	54,209	0	0	–
32	015060546	10,059	0	0	–
33	015060547	10,059	0	0	–
34	015062156	4,633	0	0	–
35	015388875	10,086	0	0	–
36	015388878	8,401	0	0	–
37	015388885	9,669	0	0	–
38	015873838	19,395	0	0	–
39	016257606	146,228	0	0	–
40	016258086	17,978	0	0	–
41	016258448	286,802	0	0	–
42	016258893	345,342	0	0	–
Total					\$–

Appendix D

Parts Stocked That Exceeded Authorized Levels

Table D. Parts Stocked That Exceeded Authorized Levels

No.	Part Number	SPY-1 Unique (Yes/No)	Quantity Authorized	Quantity On hand	Excess Parts	Value of Excess Part(s)
1	012551965	No	12	13	1	\$100,603
2	012552058	No	20	23	3	13,209
3	012559761	No	8	9	1	4,622
4	012559807	No	44	45	1	12,874
5	012559849	No	35	45	10	118,280
6	012568675	No	30	32	2	9,382
7	012568676	No	30	31	1	4,993
8	012568682	No	28	29	1	4,513
9	012568717	No	34	38	4	47,312
10	012584147	No	9	11	2	13,136
11	012584169	No	9	10	1	6,310
12	012584184	No	32	36	4	20,516
13	012584229	No	94	101	7	43,239
14	012604220	No	8	9	1	4,709
15	012604221	No	9	10	1	4,504
16	012604272	No	17	19	2	21,358
17	012604281	No	19	21	2	24,952
18	012635248	No	59	61	2	37,748
19	012648000	No	9	10	1	4,504
20	012706313	Yes	76	78	2	6,960
21	012797483	No	13	14	1	14,951
22	013182584	No	77	86	9	56,817
23	013190199	Yes	40	41	1	5,874
24	013343887	No	24	36	12	1,024,656
25	013343888	No	33	35	2	197,796
26	014128234	No	11	12	1	4,511
27	014382637	No	42	44	2	17,778
28	014547516	Yes	40	41	1	7,872

Table D. Parts Stocked That Exceeded Authorized Levels (cont'd)

No.	Part Number	SPY-1 Unique (Yes/No)	Quantity Authorized	Quantity On hand	Excess Parts	Value of Excess Part(s)
29	014547526	No	17	18	1	11,603
30	014657506	No	46	48	2	9,266
31	014824414	Yes	38	42	4	47,244
32	015047828	No	3	11	8	241,672
Total			966	1,059	93	\$2,143,764

Note: 28 of 32 Part Numbers valued at \$18 million are not unique to the SPY-1 radar. To determine the excess value, we multiplied the standard price by the excess amount for each part.

Appendix E

Parts Stocked Below Authorized Stock Level

Table E. Parts Stocked Below Authorized Stock Level

No.	Part Number	Authorized Stocking Level	Quantity On hand	Parts Shortage	Value of Part(s) with Shortage
1	012568665	75	51	-24	\$161,040
2	012583676	40	39	-1	106,857
3	012584171	33	32	-1	6,767
4	012584178	65	63	-2	23,656
5	012584261	96	69	-27	492,210
6	012584280	55	43	-12	210,768
7	012592784	42	37	-5	87,820
8	012592798	66	47	-19	310,916
9	012635247	54	42	-12	282,192
10	012683257	12	9	-3	7,473
11	012740643	41	40	-1	6,982
12	012740645	44	42	-2	13,370
13	012740646	51	49	-2	13,444
14	012740647	42	41	-1	11,768
15	013186425	194	150	-44	252,384
16	013892746	91	83	-8	42,192
17	013926982	934	798	-136	423,368
18	014370096	37	35	-2	140,654
19	014531943	56	42	-12	3,022,668
20	014547517	46	1	-45	331,470
21	014547518	48	29	-19	186,485
22	014547519	20	12	-8	68,048
23	014657498	107	48	-59	5,889,793
24	014657503	32	19	-13	2,142,621
25	014657505	36	19	-17	793,441
26	014952361	2	1	-1	9,388
Total		2319	1842	-476	\$15,037,775

Note: To determine the shortage value, we multiplied the standard price by the shortage amount for each part.

Management Comments

Department of the Navy Comments

Final Report Reference



THE ASSISTANT SECRETARY OF THE NAVY
(RESEARCH, DEVELOPMENT AND ACQUISITION)
1000 NAVY PENTAGON
WASHINGTON, DC 20350-1000

SEP 09 2015

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJECT: DODIG Audit Report, "Navy Needs to Improve the Management of Parts Required to Sustain the AN/SPY-1 Phased Array Radar System"

In response to your request, attached is a list of consolidated comments from Naval Supply Systems Command (NAVSUP), Naval Sea Systems Command (NAVSEA), United States Fleet Forces Command (USFFC), and Commander, United States Pacific Fleet (CPF).

The Navy acknowledges Department of Defense, Inspector General (DoDIG) recommendations 1.a. and 1.b., to reassess AN/SPY-1 Radar forecasting assumptions, but reiterates the validity of our current Readiness Based Sparing (RBS) model. Navy commits to continuing collaboration with all stakeholders to improve sustainment and ensure readiness objectives are met. NAVSUP will coordinate with NAVSEA, the AEGIS AN/SPY-1 Radar Program Office, and the Fleet to ensure that an annual review of Repair Parts is conducted to evaluate stock levels. NAVSUP will continue ongoing assessments of wholesale demand forecast performance to support existing semi-annual inventory management reviews with the Deputy Assistant Secretary of Defense for Supply Chain Integration, as part of the Comprehensive Inventory Management Improvement Program.

As noted in the DoDIG report, recommendations 2.a. and 2.b. for the Type Commanders (TYCOMs) to monitor and report excess stock are already incorporated into current Fleet practices. Recommendation 2.c. should be included as 1.c. for NAVSEA and NAVSUP. The TYCOMs are not the authority or responsible organization for reallocation or disposal of excess inventory.

Should you have any questions, my point of contact for this is [REDACTED]

[REDACTED] can be reached as [REDACTED]

Sean J. Stackley

Redirected draft
Recommendation 2.c as
Recommendation 1.c

Department of the Navy Comments (cont'd)

SUBJECT: DODIG Audit Report, "Navy Needs to Improve the Management of Parts
Required to Sustain the AN/SPY-1 Phased Array Radar System"

Attachments:

As stated

cc:

NAVSEA

NAVSUP

USFFC

CPF

PEO IWS

Department of the Navy Comments (cont'd)

UNCLASSIFIED Comment Resolution Matrix

Comments Matrix from Navy Review of (DRAFT) DODIG report on the AN/SPY-1 Phased Array Radar System					
Cmt #	Organization	Crit (A,S,C)	Comment	Recommendation	Rationale
1	CPF/USFF	S	The DoDIG recommendations and assertions contained in the draft AN/SPY-1 Phased Array Radar System report are predicated upon the concept that "demand or usage" equates to "need." This assumption is fundamentally flawed since the AN/SPY-1 repair parts are determined by the Readiness Based Sparing (RBS) model and not a demand-based modeled system. Per OPNAVINST 4442.5A, an RBS-modeled system is used to achieve and sustain OPNAV readiness goals and meet an Operational Availability (Ao). By design, the RBS model uses an OPNAV-approved Ao requirement to identify and stock the material critical to maintaining the weapons system readiness. Achieving a probability that the AN/SPY-1 system is "ready" to perform during a stringent wartime mission (Ao) is the primary factor in determining what material is carried and where. Demand is not a major factor.	Reassess based on a Readiness Based Sparing Model vice a Demand-Based Model	Incorrect Model type used in accordance with OPNAVINST 4442.5A
2	CPF/USFF	S	The report recommends all non-demand material be considered as excess and offloaded, and cites several monetary figures of savings or instances where the Navy should not have procured material because there was no valid need. As discussed above, the RBS model is not a demand-based model but a model that uses the objective, measurable criticality of the part to the system to determine whether to stock the material. Again, the need is determined by the model and not by demand.	Reassess based on a Readiness Based Sparing Model vice a Demand-Based Model	Incorrect Model type used in accordance with OPNAVINST 4442.5A

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Department of the Navy Comments (cont'd)

UNCLASSIFIED Comment Resolution Matrix

Comments Matrix from Navy Review of (DRAFT) DODIG report on the AN/SPY-1 Phased Array Radar System					
Cmt #	Organization	Crit (A,S,C)	Comment	Recommendation	Rationale
3	CPF/USFF	S	The report uses the standard price when discussing cost avoidance or savings. Although the DLB/repairable material was procured using the standard price, cost avoidance or savings stemming from the turn in of "excesses" should be using net price which is generally a much lower number. In fact, looking at the parts listing in the report the standard price average is \$42,454 but correctly using net price reduces the average to \$9,642.	Recommend using the net price vice standard pricing for saving analysis	Wrong pricing model used
4	CPF/USFF	S	Throughout the report, DODIG mixes "end use" or fleet-owned material with Navy Working Capital Fund (NWCF) procedures. For example, DODIG references NAVSUPINST 4500.13A when discussing shipboard "end use" or fleet-owned material. This instruction is used for NWCF material. This instruction does not apply.	Readdress and do not apply NAVSUPINST 4500.13A when addressing shipboard "end use" or fleet-owned material.	Incorrect use of procedures/instructions
5	CPF/USFF	S	The report mentions the Fleet had excess material on the DDG's over and above allowance levels. Although the Fleet has some material above allowance levels, in aggregate, this is a small percentage. This end use material is visible through Force Inventory Management Analysis Reporting System (FIMARS) and is available to be moved by the TYCOMs to satisfy demand throughout the Fleet in accordance with TYCOM guidance, the excess material will be offloaded to be redistributed, disposed of, or moved to Real-time Reutilization Asset Management (RRAM) for storage and reuse. Some TYCOMs have made the determination not to offload material except during major maintenance periods. This prevents impact to operations, churn, and saves on packing and transportation costs.	Refer to the Force Inventory Management Analysis Reporting System (FIMARS) for more accurate end use material visibility.	Although the Fleet has some material above allowance levels, in aggregate, this is a small percentage.

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Department of the Navy Comments (cont'd)

UNCLASSIFIED Comment Resolution Matrix

Comments Matrix from Navy Review of (DRAFT) DODIG report on the AN/SPY-1 Phased Array Radar System					
Cmt #	Organization	Crit (A.S.C)	Comment	Recommendation	Rationale
6	CPF/USFF		<p>DoDIG interpretation of the NAVSUP P-485 with respect to the adjustment of stock levels is not accurate. The Navy already has processes in place to revise stock levels. Authorized stock levels for repairable material are determined by OPNAV-approved models at NAVSUP and NAVSEA and any changes are made by those activities through the Automated Shore Interface (ASI) processing.</p> <p>Changes to non-repairable material are adjusted by each ship using Global Level Setting procedures in accordance with TYCOM directives. Ship CO's can also initiate changes thru Allowance Change Requests-Fixed (ACR-F) for repairables but typically these are for minor changes. Neither the technical expertise nor the tools to deem system-level criticality resides at the Fleet, TYCOM or ship level, but at the Systems Commands. Recommending decreases to repairable allowances due to lack of demand should not be initiated by the ships via an ACR-F but be part of the RBS review process.</p>	Adjustment of Stock levels should be conducted as part of the RBS review process.	Authorized stock levels for repairable material are determined by OPNAV-approved models at NAVSUP and NAVSEA.

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3

Department of the Navy Comments (cont'd)

UNCLASSIFIED Comment Resolution Matrix

Comments Matrix from Navy Review of (DRAFT) DODIG report on the AN/SPY-1 Phased Array Radar System					
Cmt #	Organization	Crit (A,S,C)	Comment	Recommendation	Rationale
7	NAVSUP	S	<p>The report states that 250 of 374 critical parts were not used within a two year period and concludes that this is ineffective. This conclusion fails to understand the intent of the Readiness Based Sparing (RBS) methodology. The RBS methodology that is used to determine on-board repair part requirements uses part reliability and criticality information, provided by the Hardware Systems Commands and Engineers, to achieve the targeted weapon system Operational Availability (Ao) at a minimum total investment cost. SPY-1 parts are stocked on ship primarily for their contribution to readiness (RBS) vice guaranteed or forecasted demand. An individual part may have a low probability of failure, such that it may not see a failure in a given two year period, but the criticality of that item is such that if it were to fail a replacement part must be immediately available (i.e., on board) in order to maintain the overall systems Ao that is required.</p>	Reevaluate Navy critical parts sparing in the context of the Readiness Based Sparing (RBS) model.	Navy adherence to the RBS model used to achieve targeted weapon system Operational Availability (Ao) while minimizing total investment cost in sparing.

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Department of the Navy Comments (cont'd)

UNCLASSIFIED Comment Resolution Matrix

Comments Matrix from Navy Review of (DRAFT) DODIG report on the AN/SPY-1 Phased Array Radar System					
Cmt #	Organization	Crit (A.S.C)	Comment	Recommendation	Rationale
8	NAVSUP	S	<p>Page 9, 1st paragraph "Unneeded Parts", 3rd sentence, the draft report states "According to the DoD Policy, DoD Components should not stock items unless there is a future need." (DoD Regulation 4140.1R May 23, 2003). This regulation has been superseded by DoDM 4140.01, February 2014. Volume 2, page 41 of the current DoDM 4140.01 provides for "Stocked Insurance" items which are essential items "for which replacement is not anticipated as a result of normal usage and for which an unacceptable lead time (procurement or order and shipping time) has been established. If failure or loss occurs, through accident, abnormal equipment or system failure, or other unexpected occurrences, the lead time required to obtain a replacement would seriously hamper the operational capability of a critical facility or weapon system." "Unneeded" in the report appears to be defined as "no-demand was experienced during the analysis period" while many of these items are stocked due to their contribution to readiness goals. The CNO directed increase in the Ao goal for the AEGIS Weapon System drove an increase in insurance-type items for the AN/SPY-1 radar.</p>	<p>Reference current DoD Manual 4140.01 regarding "stocked insurance" items.</p>	<p>Referenced regulation in the DoDIG report has been superceded.</p>
9	NAVSUP	S	<p>The \$59.68M savings is overstated. While the 181 items (of 240 identified excess) may have applicability in other weapon systems, they are stocked aboard for readiness criteria (vice demand) and may or may not be needed for other systems/applications in accordance with established wholesale and retail policies which include the fleet's offload and redistribution of assets.</p>	<p>Reevaluate Navy critical parts sparing in the context of the Readiness Based Sparing (RBS) model.</p>	<p>Navy adherence to the RBS model used to achieve targeted weapon system Operational Availability (Ao) while minimizing total investment cost in sparing.</p>

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Department of the Navy Comments (cont'd)

UNCLASSIFIED Comment Resolution Matrix

Comments Matrix from Navy Review of (DRAFT) DODIG report on the AN/SPY-1 Phased Array Radar System					
Cmt #	Organization	Crit (A.S.C)	Comment	Recommendation	Rationale
10	NAVSUP	S	<p>The report states that many shipboard items had significant excesses and deficits in their inventories. Levels of inventory above and below targeted allowances are a part of basic business when looking at a snapshot or single point in time inventory view. Excess can be attributed to changes in shipboard allowance requirements. Deficits occur as inventory is issued and used and will exist until those inventories can be replenished. The report identified 32 items in excess, valued at \$33K per hull, for a total of \$2.04M. This is less than 1% of the SPY-1 unique total inventory value. The stated deficit of \$15M is attributable to normal activity. The fleet maintained a 100% on-hand or on-order policy for stocked shipboard repair parts during the analysis window. It is unclear if the audit team reviewed dues-in (on-order assets).</p>	Reevaluate Navy critical parts sparing in the context of the Readiness Based Sparing (RBS) model.	Navy adherence to the RBS model used to achieve targeted weapon system Operational Availability (Ao) while minimizing total investment cost in sparing.

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Assistant Secretary of Defense (Logistics and Materiel Readiness) Comments



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

AUG 26 2015

MEMORANDUM FOR PROGRAM DIRECTOR FOR ACQUISITION, PARTS, AND
INVENTORY, OFFICE OF THE INSPECTOR GENERAL

THROUGH: DIRECTOR, ACQUISITION RESOURCES AND ANALYSIS

SUBJECT: Response to DoD IG Draft Report D2014-D000AG-0203.000, The Navy Needs to
Improve the Management of Parts Required to Sustain the AN/SPY-1 Phased Array
Radar System

As requested, I am providing responses to the general content and finding contained in
the subject report.

Finding: The Navy did not cost effectively manage spare-part requirements for the SPY-1 radar variants installed on the *Arleigh Burke*-class destroyers. Specifically, from October 2012 through September 2014, the Navy did not use 250 of 374 parts that it determined were critical to keep the SPY-1 radar system on board the destroyers operational. The Navy did not submit a requisition (order) for 92 of 250 spare parts in the last 5-years, which should have prompted the Navy to reassess its continued need to stock those parts. In addition, 32 of 124 parts the Navy used during that period had quantities above the authorized stock levels and 26 had quantities below the authorized levels. This occurred because the Navy:

- used forecasting methods that did not effectively determine the type and quantity of parts needed to sustain the systems; and
- did not adequately monitor and revise the authorized stock levels to more accurately reflect actual parts used.

The Navy's ineffective forecasting and management practices negatively impacted stock levels for SPY-1 radar parts. Specifically, the Navy purchased and stocked 240 parts valued at \$71.8 million without a valid or supported need. However, the Navy could save \$59.6 million if it used 181 of the 240 excess parts that are not unique to SPY-1 radar to offset the procurement of other weapon system future part requirements. In addition, the Navy may save additional cost by either reselling or disposing the remaining 59 unneeded parts that are unique to the SPY-1 radar and putting the storage space to better use. Furthermore, the Navy failed to purchase parts valued at \$15 million that it forecasted were required to enable the SPY-1 radar to achieve the Aegis Weapon System's operational availability requirements. The Navy has potentially adversely impacted the destroyers' mission readiness, unless those parts can be obtained when needed from other sources.


Assistant Secretary of Defense (Logistics and Materiel Readiness) Comments (cont'd)

Response:

Comments – The key finding was that the Navy determined critical SPY-1 radar parts requirements and then did not use the items in two years. Parts usage over a specific time frame is not an adequate measure of shipboard allowancing effectiveness. The Navy's Readiness Based Sparing (RBS) model primarily stocks parts based on their contribution to readiness and not solely on forecasted demand. Items are included (as insurance items) based on the risk to readiness of not having the item onboard. The finding does not reflect Navy policy for stocking shipboard SPY-1 radar parts.

The report mixes working capital fund inventory processes with Navy shipboard retail O&M funded inventory processes. This creates confusion in determining whether the finding targets shipboard retail stocks or wholesale level stocks or both. DoDM 4140.01, dated February 2014, and the Comprehensive Inventory Management Plan referenced in the report only apply to wholesale inventory, not shipboard retail stocks held for issue. In addition, DoD Regulation 4140.01 referenced in the report was cancelled in 2014 and should not be used for audit purposes.

I do not take issue with the recommendations as the information presented in the report indicates the Navy could do better with respect to regular review of allowances in accordance with Navy policy. However, as written, it is unclear how the finding relates to the recommendations.



David J. Berteau

Acronyms and Abbreviations

FIMARS	Force Inventory Management Analysis Reporting System
ISEA	In-Service Engineering Agent
NAVSEA	Naval Sea Systems Command
NAVSEALOGCEN	Naval Sea Logistics Center
NAVSUP	Naval Supply Systems Command
OPNAV	Naval Operations
RBS	Readiness Based Sparing
TYCOM	Type Command
WSS	Weapon System Support

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