AD-A151 620 NAVY ACTIONS TO IMPROVE OVERHAUL WORK AT THE PHILADELPHIA NAVAL SHIPYARD(U) GENERAL ACCOUNTING OFFICE WASHINGTON DC NATIONAL SECURITY AND... 01 MAR 85 1/1

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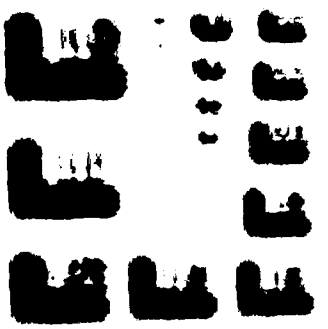

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

MARCH 1, 1985

B-217768

The Honorable Charles E. Bennett
House of Representatives

Dear Mr. Bennett:

Subject: Navy Actions to Improve Overhaul Work at the Philadelphia Naval Shipyard (GAO/NSIAD-85-51)

On January 24, 1984, you asked us to look into allegations of deficiencies in the Philadelphia Naval Shipyard's (PNSY) Service Life Extension Program (SLEP) of the aircraft carrier U.S.S. Saratoga. In our meeting with you on February 9, 1984, you asked that we evaluate actions the Navy has taken to (1) improve overall performance at PNSY and (2) preclude a recurrence of the type of technical problems experienced by the Saratoga on aircraft carrier SLEPs.

The Saratoga was the first large deck aircraft carrier to undergo major overhaul work at PNSY in over 10 years. In February 1983, the Saratoga came out of PNSY after a 28-month SLEP. During the Saratoga's sea trials in April 1983, it experienced major system breakdowns that curtailed its operations, requiring it to go to Mayport Naval Station, Jacksonville, Florida, for extensive repairs. (See enc. II for discussion of the problems and corrective actions taken.)

Following the Saratoga's technical problems, the Navy initiated and completed three studies which identified serious deficiencies in the work done by PNSY. The Navy has placed high priority on correcting them. As part of a strategy to improve the quality of PNSY's work and to prevent recurrence of similar problems, PNSY management is developing and implementing various plans to correct existing deficiencies. These plans, to be fully implemented by May 1985, include steps to

--increase compliance with technical requirements, particularly in the areas of testing and inspection;

--improve quality assurance and technical audits;

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--review the need to upgrade training requirements;

--consolidate and improve testing functions, policies, and procedures;

--hold supervisors and workers more accountable for the work; and

--monitor the implementation of the plans and eventually evaluate the effectiveness of various measures to improve performance.

The PNSY is developing a system that will assess the effectiveness of its corrective actions and is also developing analytical techniques and performance indicators, both of which will measure the quality of overall work performed. According to senior PNSY officials, it will take several years to fully develop this capability.

We believe the Navy actions have been constructive and, when fully implemented, they should improve the shipyard's operations. The Navy has developed and implemented a strategy that it believes will not only preclude the type of technical problems encountered by the Saratoga but will improve PNSY's overall work quality. As we pursue other work at the PNSY, we will monitor the implementation of the various plans, policy directives, and the Navy's progress in improving the shipyard operations. Details on the results of our review are presented in enclosure I.

The Department of Defense reviewed a draft of this report and concurred with the facts as presented and our conclusions (see enc. III).

As arranged with your office, we are restricting the distribution of this report for 10 days after its issuance. Copies will then be sent to the Chairmen, House Committees on Appropriations, Armed Services, and Government Operations and Senate Committees on Appropriations, Armed Services, and Governmental Affairs; the Director, Office of Management and Budget; and the Secretaries of Defense and the Navy. Copies will also be made available to other interested parties upon request.

Sincerely yours,

Frank C. Conahan

Frank C. Conahan
Director

Enclosures - 3

NAVY ACTIONS TO IMPROVE OVERHAUL WORK AT THE PHILADELPHIA NAVAL SHIPYARD

The Navy's Service Life Extension Program (SLEP) is designed to add 15 years to an aircraft carrier's service life by restoring, preserving, modernizing, and replacing necessary material, systems, and equipment. The Philadelphia Naval Shipyard (PNSY) and the Naval Sea Systems Command (NAVSEA) have responsibility for planning all aircraft carrier SLEPs.

The U.S.S. Saratoga was the first large deck carrier to undergo major overhaul work at PNSY in over 10 years. To do this job and other ongoing work, the shipyard increased its work force from 8,600 to 11,000. PNSY performed the Saratoga SLEP from October 1980 to February 1983, is now working on the Forrestal, and plans to begin the Independence SLEP in April 1985 and the Kitty Hawk in July 1987. Four additional aircraft carrier SLEPs are planned; however, the Navy has not decided which yard(s) will do this work.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our objectives were to evaluate the reasonableness and adequacy of Navy actions to improve overall performance at PNSY and to review steps taken to preclude a recurrence of technical problems similar to those experienced on the Saratoga on future aircraft carrier SLEPs. To address these objectives, we examined Navy studies of PNSY operations and PNSY's approach to correcting the deficiencies identified by the studies. In addition, we reviewed 10 of the Saratoga's major systems and components identified as having technical problems, such as aircraft elevators and arresting gear systems, in order to assess the actions taken to preclude a recurrence of similar problems on future SLEPs. We also reviewed seven of the shipyard's major corrective plans, recognized as the most significant by PNSY, to determine if they adequately addressed areas identified by the review teams as needing improvements and were being implemented in a timely manner.

Our work was done at (1) the Philadelphia Naval Shipyard, Philadelphia, Pennsylvania, (2) the Portsmouth Naval Shipyard, Portsmouth, New Hampshire, (3) the Mayport Naval Station, Jacksonville, Florida, (4) the Naval Sea Systems Command, Washington, D.C., (5) the Naval Ship Systems Engineering Station, Philadelphia, Pennsylvania, (6) the Naval Sea Support Center, Atlantic, Portsmouth, Virginia, (7) the Naval Air Engineering Center, Lakehurst, New Jersey, and (8) the contractor's plant that did much of the rework on the Saratoga at Mayport Naval

Station. We interviewed management and technical personnel at these locations and examined studies, program plans, schedules, and other documents.

This review was conducted in accordance with generally accepted government auditing standards and was performed from April to November 1984.

NAVY STUDIES IDENTIFIED SERIOUS DEFICIENCIES IN PNSY INDUSTRIAL OPERATIONS

After the Saratoga completed its SLEP and left PNSY, it developed system breakdowns during sea trials. This prompted the Navy to embark on three studies at PNSY to determine the cause of the breakdowns. These studies identified serious shortcomings in PNSY's overall industrial performance. Major changes to policy, programs, and operating procedures were recommended. The Navy placed high priority on identifying and correcting problems that could affect future overhaul and repair programs at PNSY, including the SLEP program. To minimize the possibility of recurrence of specific Saratoga SLEP-related problems, the Navy immediately made numerous changes in the SLEP program to resolve the technical problems experienced and to provide real-time assistance and better quality control. Once implemented, these revisions will change how PNSY manages its overhaul and SLEP programs.

The first of the three Navy studies of PNSY's operations, completed in August 1983 and conducted by personnel from the Charleston Naval Shipyard, reviewed PNSY's quality assurance procedures. This team reported that PNSY needed to take corrective actions on 45 technical deficiencies in the quality assurance area. The second study, completed in September 1983, was an assessment of PNSY's operations conducted by PNSY's senior managers. It resulted in 56 recommendations for policy and procedural improvements. For example, the study recommended revision of certain quality control and analysis procedures. The third and most comprehensive study was sponsored by NAVSEA.

Led by the Commander of the Portsmouth Naval Shipyard, the NAVSEA review team consisted of 15 senior civilian and military managers from various Navy shipyards. The team's review of PNSY's policies, procedures, and practices included assessments of hardware/equipment problems, quality control and analysis, and shipyard management and overall effectiveness. For each area, the review team recommended numerous corrective measures. For instance, in the quality control area, the team recommended that PNSY improve its job order instructions identifying all appropriate technical references and develop a comprehensive quality assurance audit and follow-up program.

The team's report stated, among other things, that widespread disregard existed at all levels for technical requirements in such areas as shipboard and shop testing, inspection requirements, calibration of instruments, and technical repair instructions. NAVSEA's overall findings focused on the need for

--improved quality performance at all organizational levels,

--reinforcement of overall shipyard policies,

--conformance to technical requirements,

--improved supervisor and worker accountability,

--controls over various testing processes, and

--shipyard internal assessments.

The final report contained more than 100 detailed findings in support of their overall conclusions and recommendations. In commenting on our report, DOD noted that the Special Review Team has subsequently made return visits to PNSY to conduct periodic assessments of corrective actions which have shown good progress.

PNSY ACTIONS TO IMPROVE ITS OVERALL INDUSTRIAL PERFORMANCE

To address the findings and recommendations of the three studies and to improve its overall industrial performance, PNSY is making many changes in the way it does business. Specifically, PNSY developed 79 program plans that, when fully implemented, are intended to carry out recommended improvements in overall shipyard operations. PNSY also issued policy directives on work quality and shipyard operations and initiated an effort to develop analytical techniques and performance indicators to measure and improve the shipyard's work quality.

These 79 program plans involve major program and procedural changes in shipyard operations. For example, some of the more significant plans provide for

--improving the timeliness and extent of the engineering services provided to the shipyard's production workers, thereby increasing their compliance with technical requirements, such as drawings and test specifications;

--improving quality assurance audits by increasing the number of staff; beginning a full scale program of surveillance inspections; and

--establishing a system which will enable production shops to know when all production work is completed for selected systems and also making supervisors responsible for ensuring that work of their subordinates is satisfactorily completed.

In addition, actions were taken to conduct technical audits of the current SLEP on the Forrestal and consolidate testing functions for the hull, propulsion, and auxiliary machinery area.

We found that these plans addressed deficiencies identified by the review team, established specific milestones for their completion, and were being implemented on schedule. The Navy believes that the 79 plans address all major deficiencies and that progress had been made in correcting them. As of June 1984, PNSY had implemented 22 of 79 plans, and according to PNSY officials, all the plans should be implemented by May 1985.

The 79 plans represent a major effort by the Navy to improve PNSY's overall industrial operations. Seven of these plans, recognized as the most significant by PNSY, are intended to address the major findings of the NAVSEA review team and were substantially complete at the time of our review. Our review of the seven plans indicated that they adequately addressed deficiencies identified by the review teams, and were being implemented in a timely manner.

Each of the seven plans dealt with improving the operating procedures of one or more of the major organizations responsible for the shipyard's repair and overhaul work. Included were the Production Department, the Testing Division, the Design Division, and the Quality Assurance Office. These plans represent major policy and procedural changes.

For example, one major plan dealt with consolidating and improving PNSY's individual testing functions for the hull, propulsion, and auxiliary machinery area under one department. In addition, PNSY established new test policies and procedures designed primarily to ensure the production shops are accountable and responsible for their work quality. Related actions were the establishment of a shop test program, a revised shipboard test program, and a formalized and systematic approach to the hydrostatic testing and flushing of piping systems by the production shops.

In addition to the program plans, PNSY management issued new policy directives on work quality, shipyard operations, schedule adherence, cost control, personnel management accountability, supervisors' responsibility for inspection of work, and safety. These new directives supplemented the program plans and were explained to shipyard employees by the PNSY commander during 18 meetings held over a 2-week period. To reinforce these meetings, PNSY organizations were required to develop plans to ensure employee adherence to quality and operational policies. We interviewed over 40 shipyard personnel at all grade levels. They were aware of the new priority and emphasis put on accountability and other changes.

PNSY lacks the capability to assess overall effectiveness of its corrective measures

PNSY lacks a system, according to Navy officials, to assess the effect of its corrective measures on the quality of work throughout the shipyard. PNSY officials advised us that they recognized this need and were in the very early stages of developing quality performance indicators for the shipyard. Specifically, in March 1984, PNSY initiated a program to collect information that will be used to develop the indicators needed to measure overall shipyard effectiveness. Senior officials at PNSY think that it will take several years for the shipyard to fully develop this capability.

PNSY ACTIONS TO ADDRESS SPECIFIC U.S.S. SARATOGA-TYPE PROBLEMS IN FUTURE SLEPS

After completion of its SLEP and while on sea trials, the Saratoga developed serious problems that curtailed its operations and required it to return to port for rework at the Mayport Naval Station at an estimated cost of $18 million. The Navy analyzed the specific deficiencies that were identified and took several actions to prevent their recurrence in future SLEPs. Some of those actions follow.

--Boiler and aircraft elevator teams were established to provide rapid technical response to on-site problems.

--A preventive maintenance system was established for equipment in the shipyard's custody. This program will be further expanded on the Independence SLEP.

--A computerized program was created that established the baseline condition of the ship and is used to identify

and correct electrical discrepancies and other safety-related conditions.

--New quality control procedures were established for catapults and arresting gear that identify early any discrepancies requiring corrective actions on new work requirements.

--A high pressure valve control improvement program was established that resulted in standardized job orders and changed shop procedures.

--Corrosion control for catapult installations was imposed. This will be further improved on the Independence SLEP.

--Quality assurance plans were developed for catapult and arresting gear systems for use by PNSY personnel in job preparation, test requirement development, and actual testing.

We reviewed 10 major problem areas that severely impaired the Saratoga's operations, such as the aircraft elevators and stowage facilities and arresting gear and catapult systems. According to the Navy, the technical problems the Saratoga experienced with these sophisticated ship components included both operational failures or shortcomings and material and design deficiencies.

In many cases, the Navy relies upon personnel who have expertise in specific technical areas to solve technical problems. For example, if catapult or arresting gear system problems occur, the Navy calls upon experts from the Naval Air Engineering Center to take the lead in resolving the problems. For several of the problems we reviewed, the Navy sent teams of technical experts to the Saratoga to analyze and resolve them. The Navy, in many cases, issued new instructions/procedures, revised specifications, established new technical teams, and revised numerous processes and procedures. The details concerning the 10 systems and equipments, their reported technical problems, and related Navy corrective actions are listed in enclosure II.

ENCLOSURE II

EQUIPMENT, PROBLEMS, AND CORRECTIVE ACTIONS TAKEN

Selected items	Reported technical problem	Navy corrective actions taken
Sea valve pins	Sea valves failed because improper material was used.	New instructions and procedures were developed to ensure that the proper material is used.
Main steam valves	Valves leaked.	New procedures were developed for overhauling valves, and more inspections will be done on contractor materials.
Arresting gear system	Hydraulic fluid was contaminated due to loss of preservative in engine fluid system and lack of proper cleaning and removal of contamination.	New instructions were developed regarding the care, inspection, installation, flushing, and preservation of the arresting gear system in order to preclude contamination.
Main feed pumps	Excessive steam leaks existed because steam seal and turbine casings were not aligned.	Specifications were revised to ensure correct alignments. Additional inspections and status reports were also required.
Deck edge elevator system	System was inoperative.	Procedures were revised and a technical team was established to give special attention to the overhaul work being completed.
Communications system	Segments of system were inoperative due to government-furnished equipment problems and delays in scheduled repairs.	Procedures were revised to eliminate delays and ensure government-furnished equipment would operate.

ENCLOSURE II

F-14 stowage facilities	Stowage alterations were deficient for various reasons.	Processes, guidance, and instructions were revised to ensure that work would start earlier in the SLEP.
Flight deck paint	Paint separated from deck due to cohesive failure.	Processes and specifications were revised to ensure that the paint does not separate.
Bridge wiper motors	System failed because motors were not watertight.	Procedures were revised to ensure that the motors are watertight.
Ship systems turbo generators	Casings contained cracks.	Procedures were developed to determine if the casings were cracked and to ensure that they would be replaced when necessary.

ENCLOSURE III

THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D C 20301

MANPOWER
INSTALLATIONS
AND LOGISTICS

. 2 FEB 1985

Mr. Frank C. Conahan
Director, National Security and
International Affairs Division
U.S. General Accounting Office
Washington, D.C. 20°44

Dear Mr. Conahan:

This is in reply to your draft report entitled "Navy Actions to Improve the Overhaul Work Being Accomplished at the Philadelphia Naval Shipyard" dated January 11, 1985, OSD Case 6672, GAO Assignment Code 394029.

DoD concurs with the report. The Naval Sea Systems Command sponsored a Special Review Team in October 1983 to produce a report containing 122 specific items listing discrepancies and recommended action. The Special Review Team has subsequently made return visits to the Philadelphia Naval Shipyard to conduct periodic assessments of corrective actions which have shown good progress.

DoD appreciates the opportunity to comment on the audit.

Sincerely,

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

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