GAO

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

May 1987

NAVY MANPOWER

Squadron Manpower Program Needs Improvement

GAO/NSIAD-87-101

GAO

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The Honorable Les Aspin
Chairman, Committee on Armed Services
United States House of Representatives

Dear Mr. Chairman:

On April 18, 1985, you asked us to determine the degree to which the services' manpower requirements are based on sound and rigorous processes. This report, which examines the Navy's Squadron Manpower Document (SQMD) program, is the third in a series which has now looked at all the Navy's manpower determination processes.

Like the earlier reports on the shore and ship manpower programs, this report identifies a number of areas where the program could be improved. We are recommending that the Navy take steps to improve its squadron manpower program by (1) developing staffing standards for as many positions as practical, (2) ensuring the accuracy of staffing standards, work loads, work load allowances, and workweek time factors by using acceptable work measurement methods, reviewing them periodically, and properly documenting them, and (3) improving the standards application process to ensure the accuracy of maintenance work load data and implementing appropriate management controls.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 5 days from the date of the report. At that time, we will send copies to the Chairmen, Senate Committee on Armed Services, House and Senate Committees on Appropriations, House Committee on Government Operations, and Senate Committee on Governmental Affairs; the Secretary of Defense; the Secretary of the Navy; and the Director, Office of Management and Budget. Copies will also be made available to other interested parties upon request.

Sincerely yours,

for Bill W. Thurman

Frank C. Conahan
Assistant Comptroller General

Executive Summary

Purpose

Navy personnel will cost $34 billion in fiscal year 1987, a third of the Navy's budget. At the request of the Chairman, House Committee on Armed Services, GAO has been reviewing the way the Navy determines its manpower needs. GAO has previously issued reports on the Navy's shore and ship manpower programs. This report is concerned with the Navy's Squadron Manpower Document program, which determines manpower requirements for aircraft squadrons.

This report examines whether the program accurately identifies, through generally accepted management engineering concepts and methods, the quantity and quality of squadron manpower requirements.

Background

The Navy established the Squadron Manpower Document program in 1969. As of May 1986, the program covered approximately 85,000 officer and enlisted positions. Personnel costs associated with these positions is about $2 billion annually.

In reviewing the Navy's determination of squadron manpower requirements, GAO focused on the way the Navy establishes requirements for ground officer and ground enlisted positions, which together represent over three-quarters of squadron requirements. (GAO did not examine requirements for flight crew personnel.)

Results in Brief

The number of officer and enlisted positions the Navy says it needs to operate and maintain its aircraft squadrons is subject to question because

- the staffing standards, maintenance work load, work load allowances, and workweek time factors used to determine most squadron manpower requirements are unsupported by documentation and are not periodically reviewed; and
- a significant number of requirements are directed by the Chief of Naval Operations, are based largely on corporate management judgment rather than measured work load, and are not supported by documented justification consistent with established guidelines.

Principal Findings

No Staffing Standards for Many Positions

All ground officer requirements and almost 20 percent of ground enlisted requirements are directed by the Chief of Naval Operations and are not based staffing standards using measured work load. The Navy has no written procedures for the establishment of these directed requirements and no documentation for the procedures used to establish them. Ground officer requirements are based on historical precedent, corporate management judgments, and the available inventory of ground officers in the Navy as a whole.

Staffing Standards Questionable

The staffing standards that do exist are questionable. No documentation exists for the initial development of the staffing standards used for ground enlisted requirements, nor have the standards been periodically updated. The Navy also does not require that new or revised standards be based on efficiency reviews (studies of the most efficient method of performing a given task), as directed by DOD guidance.

Work Load Accuracy Not Validated

Work load is based on data that is not independently verified, and requirements are calculated inconsistently. Work load is not always documented or periodically reviewed.

Unverified Allowances Added to Work Load

The allowances for nonproductive time added to work load have not been based on supportable evidence and need to be studied. As a result of the way these allowances are applied, the amount of nonproductive time can exceed the productive time needed to accomplish a given amount of work.

Workweek Estimates Not Supported

The Navy workweeks used to determine manpower requirements (63 hours for carrier-based squadrons and about 32 hours for some shore-based squadrons) may not be appropriate. These workweeks are unsupported with reliable documentation and have not been updated since they were established.

Questions About Program Support

Some of the problems in the Squadron Manpower Document program may be attributed to limited program support. For example, travel funds may not be sufficient to ensure representative data gathering. In addition, at the time of our review, some key positions were vacant, staff turnover was high, and personnel assigned to the program often lacked adequate manpower experience.

Recommendations

GAO makes a number of recommendations to the Secretary of the Navy to improve the credibility of the manpower planning process, including

- developing staffing standards based on efficiency reviews for as many positions as practical, both officer and enlisted;
- ensuring the accuracy of staffing standards, work loads, work load allowances, and workweek time factors by using acceptable work measurement methods, by reviewing them periodically and properly documenting them; and
- improving the standards application process to ensure the accuracy of work load data by increasing the use of work measurement techniques and adding appropriate management controls.

Agency Comments and GAO Evaluation

The Department of Defense (DOD) agreed that more attention needs to be given to documentation and to review of standards and other factors used in the determination of manpower requirements. Navy actions to address these problems were outlined. DOD also agreed to conduct studies to determine appropriate work load allowances and noted that workweek factors have already been revised. However, DOD was concerned that the report implied that (1) the Squadron Manpower Document program generates excessive requirements, and (2) manpower requirements can only be validated through engineered studies. GAO did not attempt to specifically determine what the requirements should be; rather to assess whether the requirements determination process was as accurate as it could be through the appropriate use of objective measurement techniques.

Contents

Abbreviations

CNO	Chief of Naval Operations
DCNO	Deputy Chief of Naval Operations
DOD	Department of Defense
MPT	Manpower, Personnel, and Training
NAVMEC	Navy Manpower Engineering Center
NMRS	Navy Manpower Requirements System
SQMD	Squadron Manpower Document

Introduction

Maintaining our military capability while controlling costs requires an accurate and reliable manpower[1] planning system. Inaccurate manpower requirements can result in having too few or the wrong kinds of people and can adversely affect the ability of the services to successfully fulfill their roles in support of the national military strategy. Having too many people, on the other hand, unnecessarily increases the services' personnel costs. In fiscal year 1987, over $125 billion of the defense budget is related to personnel. The increasing need for high-quality people because of technological advances in weapons, coupled with the much smaller recruitable population expected in the next decade, is likely to push costs even higher.

Over the years, various committees have urged the military to develop more credible systems for establishing manpower requirements by using, where appropriate, management engineering concepts and methods for determining manpower requirements.

The Navy has implemented three manpower-determination programs; the Shore Manpower Document program, the Ship Manpower Document program, and the Squadron Manpower Document (SQMD) program. We examined the first two in earlier reports.[2] This report discusses the SQMD program, which determines manpower needs for aircraft squadrons.

Squadron Manpower Document Program

In 1969, the Navy established the SQMD program to determine and document manpower requirements for all active-duty and most reserve aircraft squadrons. As of May 1986, the program covered approximately 85,000 positions—about 14,000 officers and about 71,000 enlisted personnel. Personnel costs associated with these positions are about $2 billion annually.

The responsibility for the overall control and direction of the program lies with the Deputy Chief of Naval Operations (DCNO) for Manpower, Personnel, and Training (MPT), within the Office of the Chief of Naval Operations (CNO). The program is supported by the Navy Manpower Engineering Center (NAVMEC), which develops and applies staffing criteria.

[1] "Manpower," in the context of military personnel management, is a generic term used to refer to the demand for workers, regardless of gender. In this report, "manpower requirements" refers to positions, and "personnel" refers to actual people.

[2] Navy Manpower Management: Continuing Problems Impair the Credibility of Shore Establishment Requirements (GAO/NSIAD-85-43, Mar. 7, 1985); and Navy Manpower: Improved Ship Manpower Document Program Could Reduce Requirements (GAO/NSIAD-86-49, Mar. 1986).

The CNO staff responsible for manpower establish all ground officer and some ground enlisted positions. NAVMEC determines all other ground enlisted positions, based on a squadron's work load (the operational and maintenance tasks that the squadron would need to perform in wartime) and staffing standards (the amount of time or computed number of positions required to perform a given amount of work).

After a squadron's total manpower requirements have been established, NAVMEC consolidates the requirements in a draft SQMD for review by operational commanders and approval by the DCNO(MPT). After resolution of any problems, the SQMD is finalized and used to justify manpower requirements and to make manpower planning decisions.

The Navy's squadron officer and enlisted manpower requirements fall into two main categories—flight crew and ground. Enlisted ground positions are further categorized as directed ground, maintenance and indirect work load, and support services. Directed ground positions are those deemed by the CNO and other authorized managers to be essential but are not based on actual measured work load. Indirect work load includes administrative support and facilities maintenance—such as painting and cleaning, and utility tasking—such as loading of food and supplies. Support services include medical, food, and laundry services. Table 1.1 shows the total number of requirements in each category.

Table 1.1: Squadron Manpower Requirements by Staffing Category

	Requirements	
Staffing category	**Number**	**Percent of total requirements**
Officer		
Flight crew	11,662	13.7
Ground (directed)	1,765	2.1
Total officer	**13,427**	**15.8**
Enlisted		
Flight crew	7,639	9.0
Ground		
Directed	14,079	16.6
Maintenance and indirect work load	39,879	47.0
Support services	9,835	11.6
Total enlisted	**71,432**	**84.2**
Total requirements	**84,859**	**100.0**

Objective, Scope, and Methodology

This review is part of a series of reviews to evaluate the processes used to determine the services' manpower requirements. During the course of this work, the Chairman, House Committee on Armed Services, requested that we examine the soundness and rigor of the processes the services use to determine manpower requirements. This report is a partial response to that request.

The objective of this review was to determine whether the Navy's SQMD program accurately identifies, through generally accepted management engineering concepts and methods, the quantity and quality of aircraft squadron manpower requirements. We focused our work on the adequacy of Navy operating procedures and practices for the SQMD program and on the extent of management support for the program. Specifically, we wanted to determine whether the Navy

- uses accepted management engineering concepts and methods to establish manpower requirements,
- uses reliable data elements and valid work load data to determine the numbers and kinds of positions needed, and
- provides the resources needed to support the program.

We concentrated our work on the Navy's determination of manpower requirements for squadron ground officer and ground enlisted positions, which represent over three-quarters of squadron requirements. We did not examine requirements for flight crew personnel.

In performing our work, we interviewed officials at the Department of Defense (DOD), the Navy (manpower, logistics, and operational/ training activities), the Air Force, airline companies, and aircraft manufacturers. (See app. I for a complete list of the agencies and organizations we visited.) We also reviewed related DOD and Navy policies, directives, correspondence, and studies. In addition, we observed both of the SQMD validation teams during on-site squadron visits, tested NAVMEC's application of work load data, and assessed the reliability of NAVMEC's computer model for deriving squadron manpower requirements.We conducted this review during the period July 1984 through August 1986, in accordance with generally accepted government auditing standards.

Problems With the Determination of Manpower Requirements for Aircraft Squadron Positions

Currently, the Navy is unable to fully justify the squadron manpower requirements it has identified because many are established without using appropriate management engineering concepts and methods or using questionable staffing standards, work load data, work load allowances, and workweek availability factors. As a result of these shortcomings, the credibility of the Navy's squadron manpower requirements is subject to question.

Navy Has No Staffing Standards for Many Positions

Squadron manpower requirements, other than those for flight crews, are either derived from staffing standards or are directed by the CNO based on other criteria. Staffing standards are mathematical equations that determine the number of positions needed, based on measured or projected work load. Directed requirements are those based on corporate judgment rather than being associated with a particular measurable work load.

The Navy needs staffing standards covering as much of the workforce as feasible to manage its manpower effectively and to credibly determine its manpower needs. These standards must be based on a reasonably accurate computation of work load. For those jobs where it is not practical to develop work load-based standards, manpower requirements should be based on written guidelines that state the procedures to be followed in determining and documenting the need for these positions. The need for any positions established through this approach, like those based on work load, should be periodically reviewed.

As of May 1985, all ground officer requirements (over 13 percent of all squadron officer manpower requirements) and almost 20 percent of the ground enlisted position requirements were CNO-directed. (See table 2.1.)

Table 2.1: Directed Manpower Requirements as of May 1985

Personnel	Total requirements	Directed requirements
Officer	13,427	1,765 (13.2%)
Enlisted	71,432	14,079 (19.7%)
Total	**84,859**	**15,844 (18.7%)**

Requirements for Ground Officers

Ground officer positions include a variety of support and administrative positions, such as flight surgeons and legal, maintenance, intelligence, and training officers. All ground officer positions are directed positions. They are not based on measured work load but on what the Navy refers

to as a ground officer "algorithm." While this term suggests a systematic mathematical approach to developing requirements, as used here it represents a list of positions the Navy believes are required, based largely on corporate management judgment.

The Navy has no written guidelines for establishing ground officer requirements, and it has inadequate records to support the requirements ultimately established. According to CNO officials, ground officer requirements are established annually through a series of meetings attended by various representatives of the aviation community—including the CNO and functional and type commands (such as Commander, Naval Air Forces, and U.S. Atlantic Fleet). When the requirements are approved by the DCNO(MPT), they are forwarded to NAVMEC for use in developing a squadron's manpower requirements document. NAVMEC does not validate the information.

According to a CNO official, the ground officer requirements are not based on measurable work load, but on historical precedent and on judgments on how to

- provide squadrons with non-flying officers who can assume command and control functions during periods of heavy combat flight operations,
- provide a career development path for ground officers, and
- balance the inventory of ground officers in the Navy by assigning them to squadrons in some equitable fashion.

A 1981 CNO-contracted study of the Navy's development of officer requirements criticized the Navy's methodology, stating that the "methodology used is not sufficiently quantitative in nature to provide adequate justification for the ground officer requirements."[3] The CNO-level working group that reviewed the study recommended that the CNO prepare ground officer staffing guides, which would be reviewed by the Functional Wing Commander, the Type Commander, and the Commander in Chief for each squadron in the Navy. The group also recommended that each staffing guide contain a set of fixed ground officer requirements considered vital to that squadron, regardless of the squadron population. Further, the group recommended that, after these requirements were established, requirements for ground officers for administrative support be determined by aircraft type. Once these steps

[3]Development of Officer Requirements Study (Resource Consultants, Inc., N00014-81-C-0125, June 1981).

were accomplished, the working group proposed that the ground officer requirements be entered into NAVMEC's automated data base.

The CNO did not adopt all of the working group's recommendations but, in June 1985, directed NAVMEC to develop an improved methodology for establishing ground officer requirements. As of August 1986, however, the methodology had not yet been developed.

Requirements for Directed Ground Enlisted Personnel

The CNO also directs requirements for almost 20 percent of ground enlisted positions. These positions include those for command master chiefs, certain squadron aircraft maintenance supervisors, maintenance quality assurance personnel, security and fire watch personnel, and career counselors. Once these positions are established, requirements are automatically included in a squadron's manpower-requirements document. Similar to ground officer requirements, the CNO has no procedures describing how directed requirements are to be determined and no documentation to support the directed requirements that currently exist.

Although rigorous staffing standards for all positions are probably not feasible, the need for CNO-directed positions cannot be validated without documentation of their rationale. In the absence of adequate documentation, some positions may be perpetuated longer than necessary.

Agency Comments and Our Evaluation

DOD agreed that staffing standards and improved documentation procedures for ground officers and some enlisted requirements are needed. A ground officer staffing standard is expected to be approved by the CNO by October 1987. For ground enlisted requirements, DOD agreed that written procedures and documentation need improvement and stated that improved guidelines and procedures will be developed by the end of fiscal year 1987 and pertinent standards developed by the end of fiscal year 1989.

DOD believes that most ground enlisted requirements are documented in various CNO instructions, and expressed concern that readers might infer that directed requirements are not really valid. DOD stated that these requirements receive extensive scrutiny and are "rigorously verified by SQMD analysts during on-site manpower surveys using work measurement techniques."

While we agree that the authority for most of the ground enlisted requirements are cited in various CNO instructions, there is very little in those instructions to provide the rationale for determining how many and what types of positions are needed. In the absence of this kind of documentation, analysts reviewing squadron manpower needs have little basis for judging whether such positions are still needed.

Some SQMD Program Data Elements Are Not Accurate

In determining all other ground enlisted manpower requirements, NAVMEC uses a manpower modeling system whereby staffing standards and the projected weekly work load for a squadron work center are simulated on computers. As part of this process, maintenance work load is increased by adding allowances to account for certain nonproductive time. Then, the total weekly required hours are divided by the productive hours available in a week to derive the quantity of enlisted positions needed for that work center. For the Navy to establish minimum squadron ground enlisted manpower requirements, such SQMD program data elements as staffing standards, work load data, work load allowances, and Navy workweek time factors must be accurate.

Staffing Standards

The Navy uses staffing standards to relate tasking to manpower equivalents. In the SQMD program, staffing standards consist of either equations or factors such as aircraft maintenance manhours per flight hour. In reviewing these standards, we found that they have not been periodically updated and are not based on efficiency reviews.

Staffing Standards Have Not Been Periodically Reviewed

It is generally recognized that staffing standards should be periodically reviewed because operations can change over time, thus rendering standards inaccurate. Defense guidance specifies that all standards are to be reviewed at least once every 3 years.[4] While Navy guidance also recognizes the need for periodic update, it specifies no time period for performing such a review. To aid in the periodic assessment and revalidation of program elements, Navy regulations also require that supporting documentation of updates be maintained.

According to NAVMEC personnel, SQMD staffing standards were initially developed in the 1970s. However, according to Navy officials, some of the records documenting the procedures, analyses, and results of the

[4]DOD Instruction 5010.37, "Efficiency Review and Resource Requirements Determination," Feb. 7, 1985.

original standard development processes were discarded after SQMD analysts encountered difficulty in interpreting the data.

Of the original SQMD standards, only certain aspects of some standards have been updated. While the age of staffing standards does not necessarily mean that they are no longer accurate, they should be periodically reviewed to ensure accuracy and continued applicability. The officer in charge of the SQMD Standards Review Branch said that standards are usually updated when SQMD analysts, during the normal course of developing SQMDs, recognize problems or deficiencies, when new equipment items or organizational changes cause existing standards to become inaccurate, or when other factors arise which cause the standards to become outdated.

According to SQMD officials, standards have not been reviewed as specified in Defense guidance because of

- a lack of people in the Standards Review Branch,
- a lack of staff continuity and loss of productivity created by the rotation of military personnel, and
- a lack of travel funds to allow for the on-site gathering of data at specific squadrons.

To ensure that its squadron manpower requirements reflect actual wartime needs, the Navy needs to periodically review all SQMD staffing standards. We believe that the Navy needs to specify a time frequency for reviewing staffing standards and to maintain supporting documentation for the standards.

Standards Are Not Based on Efficiency Reviews

Defense criteria (DOD Instruction 5010.37) requires that staffing standards be based on the most efficient method of performing the function under review. The guidance states that it is applicable to all organizations, both fixed-site and deployable, and that the same policies and procedures should be used when practicable in combat units and organizations.

Efficiency reviews involve examinations of actual work processes and work flows to identify work methods or organizational arrangements that may be nonessential, duplicative, or otherwise inefficient. The Navy does not perform these reviews with regard to squadron operations, and consequently, is establishing manpower requirements based on work load data that may include inefficiencies in the way work is

now done. Such a process tends to reward the less efficient squadrons by increasing the documented number of work hours, thereby ultimately resulting in more manpower requirements than would be necessary if the work were done efficiently.

The absence of efficiency reviews casts doubt on the accuracy of the Navy's squadron manpower requirements. We believe that the Navy should require that efficiency reviews be performed before developing and updating SQMD staffing standards to ensure that standards are based on the most efficient work methods.

Agency Comments and Our Evaluation

DOD agreed that full supporting documentation of SQMD staffing standards has not been maintained and, in the past, staffing standards have not been formally reviewed on a rigorous, periodic basis. DOD noted that corrective action is underway, requiring that all new or revalidated standards submitted by NAVMEC for CNO approval contain all supporting documentation and position justifications for permanent files and that standards be reviewed at least every 3 years. However, DOD did not agree that its efficiency review guidance requires method studies in combat units such as squadrons, and noted that the Navy is applying efficiency review procedures in the SQMD program to the maximum extent feasible, employing techniques to minimize work load inflation, duplication of tasks, and inappropriate tasking.

DOD's efficiency review guidance states that efficiency review "policies and procedures should be used when practicable in combat units or organizations." There is no indication that the feasibility of applying these procedures to aircraft squadrons has been studied and found to be impractical, or that the SQMD program generally employs the kinds of techniques cited by DOD.

Work Load Data

In determining an aircraft squadron's ground enlisted manpower requirements, NAVMEC must establish the squadron's work load. This work load is largely comprised of maintenance work, which generates about 62.5 percent of a squadron's ground enlisted manpower requirements and consists of three categories:

- Corrective maintenance refers to work accomplished on an unscheduled basis to correct equipment and part malfunctions, failures, deterioration, or depletion.

- Planned maintenance refers to work performed to accomplish scheduled maintenance actions, such as systematic, periodic inspections to maintain equipment in satisfactory operating conditions and to detect possible causes of equipment or part failures.
- Indirect maintenance refers to administrative support work actions associated with the internal functioning of the squadron, facilities maintenance work, which includes routine housekeeping of assigned spaces; and utility tasking, which involves the temporary assignment of squadron personnel to ad-hoc working parties aboard carriers to perform such miscellaneous work as onloading of food and supplies.

We found that the ways in which these work loads are calculated are subject to question and that work load data is inadequately documented and verified.

Calculation of Corrective Maintenance Work Load

To establish a squadron's predicted wartime corrective maintenance work load, NAVMEC uses regression analyses to determine the statistical relationship between work load and various levels of flight activity based on past performance. For example, corrective maintenance time required for a given aircraft can be related in an algebraic formula or equation to flying hours and expressed as maintenance manhours per flight hour. Once this relationship is determined, maintenance requirements for a number of projected operating tempos can be predicted, such as the maintenance manhours per flight hour or per flight sortie or per the maximum number of flight hours reported in a given period. This technique allows NAVMEC to choose a projected maintenance manhour figure from predicted wartime operational levels.

NAVMEC has limited guidance on how to select predicted squadron corrective maintenance work load. The NAVMEC analyst responsible for this task stated that he was following the oral instructions of a predecessor. In making a maintenance manhour work load selection, the analyst told us that the concerned squadron's work load data is compared with work load data from a similar squadron, and a subjective decision is then made on which data will be used to calculate maintenance manpower requirements for that squadron. We observed that NAVMEC usually selects a work load that closely matches the work load used in developing the prior manpower requirements document. The NAVMEC analysts who make the selections told us that the work load figure selected is usually higher than that used in the previous document because they believe that the aircraft will probably require more maintenance as it

gets older. However, they acknowledged that this logic ignores the periodic overhaul of aircraft, which could tend to stabilize the amount of maintenance performed. The repeated selection of the higher work load will tend to provide for a gradual, but steady, increase in SQMD requirements over time. We believe that the methodology for predicting and selecting future squadron maintenance work load should be based on statistically accepted methods and should be clearly documented.

In commenting on a draft of this report, DOD agreed that, in the past, the procedures for calculating corrective maintenance work load were not fully standardized. They stated, however, that the CNO has since directed NAVMEC to develop a standardized, statistically valid procedure based on comprehensive maintenance data review and documentation. This development is underway and scheduled for completion by the end of fiscal year 1987. DOD also said that several interim improvements have been made based on analysis of procedures to date.

Calculation of Planned Maintenance Work Load

The Navy has developed planned maintenance tasks for each type of Navy aircraft and has estimated the time to accomplish each task. In determining manpower requirements, NAVMEC totals the estimated times for doing these tasks to establish the planned maintenance work load of a squadron. However, the estimated times to perform these tasks are not necessarily representative of the actual time needed to perform them since the estimates are not determined by engineered work measurement techniques, such as time studies or work sampling. Instead, according to aircraft manufacturers and Navy officials, the time allowed for performing a planned maintenance task is based on the judgment of individuals who have worked on that aircraft or on a similar aircraft.

Although, according to Navy officials, their procedures call for a validation of the necessity for the maintenance requirement tasks by the aircraft manufacturer and the cognizant Navy activity, these processes do not ensure the accuracy of time estimates for performing planned maintenance tasks. Navy officials said that the verification of the estimated time to perform a maintenance task is done only on an exception basis—that is, when a squadron challenges the time allowed. When done, verifying personnel said that they do not do any work measurement studies, but rather they rely on information provided by work center personnel.

Because the Navy does not have an adequate method for ensuring the accuracy of data on time needed to perform maintenance tasks and does not use engineered work measurement techniques in establishing the

time for performing aircraft planned maintenance tasks, the NAVMEC methodology of establishing squadron planned maintenance work load does not adequately support established maintenance manpower requirements. We believe that the Navy should ensure the accuracy of planned maintenance work load used in establishing maintenance manpower requirements by requiring the use of acceptable work measurement techniques in establishing the time anticipated for performing aircraft planned maintenance tasks.

Calculation of Indirect Maintenance Work Load

Since indirect work load duties—such as routine cleaning, painting, and storing supplies—require no specialized skills and anyone in the squadron can perform them, SQMD regulations state that no positions are supposed to be established solely for indirect maintenance. However, the SQMD computer model was programmed to add the indirect maintenance work load of each work center in the squadron's maintenance department to the work center's maintenance work load, and the total work load is divided by the applicable Navy productive workweek figure to calculate manpower requirements for the work center.

If the result of a computation has a fractional manpower requirement, the computer is programmed to round it off to a whole number. For small units, a position would be added if the work load exceeds the baseline requirements by 5 percent of the work load one person could accomplish. For larger units, a position would not be added unless the work load exceeds the baseline requirement by at least 50 percent of the work load one person could accomplish. For example, in a carrier-based squadron unit with a requirement for one position, another position would be added if work load data is greater than 1.05 positions. However, in a unit with 10 manpower requirements, another position would be added only if work load data is greater than 10.5 positions.

Since the SQMD rounding process could overstate total manpower requirements if indirect maintenance requirements are computed on a work center basis and there are a number of small work centers, the manpower requirement for these types of duties should be computed on, at least, a department-wide basis. Allocating this work on a department-wide basis is feasible since indirect maintenance requires no specific

skills. In a similar situation identified in our review of the ship manpower document program, the Navy agreed to allow indirect work load to cross work-center lines within a department.[5]

Inadequate Controls on the Accuracy of Work Load Data

The Navy does not provide adequate checks to ensure that work centers properly document maintenance data. Navy procedures require work center supervisors to certify the correctness of maintenance documentation. This is the only check on the accuracy of the time recorded for performing maintenance tasks. Other Navy maintenance work load review processes involve only ensuring that the data is in the proper format for computer processing and do not address the accuracy of the time reported for the performance of maintenance tasks.

Because NAVMEC has to predict squadron corrective maintenance work load to calculate maintenance manpower requirements, SQMD validation teams are supposed to verify work load data during their on-site squadron visits and are responsible for finding any cases of squadron over- or understatement of work load and for making necessary adjustments to the predicted work load. We found that the SQMD teams do not review squadron maintenance documentation for accuracy and make no adjustments to NAVMEC-predicted maintenance work load. Furthermore, their current approach toward verification of work load data is subjective. The teams compare computed requirements based on the squadron's monthly maintenance production reports for the most recent 6-month period, estimates of manpower needs based on discussion with maintenance work-center supervisors or senior work-center personnel and the NAVMEC-established requirements. From this comparison, they subjectively decide on the positions to be recommended to DCNO(MPT) as needed. In many instances, these decisions are made without visiting any work centers to review maintenance documentation or to observe ongoing work.

Some independent verification of data accuracy is required as an internal control mechanism to maintain the validity of the manpower system. We believe that the Navy should strengthen the validation process for aircraft squadron corrective and planned maintenance work load by requiring an independent, periodic review of the accuracy of reported maintenance work load.

[5]Navy Manpower: Improved Ship Manpower Document Program Could Reduce Requirements (GAO/NSIAD-86-49, Mar. 1986).

We also found some inconsistency in the criteria used by various SQMD teams, which creates questions about the accuracy of work load data and resulting manpower requirements. In a number of cases, we found that the SQMD teams analyzed the squadron's maintenance production reports using different criteria regarding what data to include in calculating maintenance manpower requirements. For example, in one location, planned maintenance data was included; in another location, it was not included. In a test of the effect of these differences we found that applying the different criteria to one helicopter maintenance work center resulted in estimates of 12 and 14 as the number of enlisted positions needed.

These problems seem to exist because NAVMEC's implementing procedures lack specificity. Existing procedures require that a verification of predicted corrective maintenance work load data be performed, but they do not state how this should be done.

The SQMD teams' inconsistent approach raises questions about the accuracy of maintenance manpower requirements. We believe that the teams should validate aircraft squadron historical maintenance data by analyzing data and other materials related to work load to ensure that maintenance work is properly reported and accurately recorded.

Agency Comments and Our Evaluation

DOD said that corrective maintenance data receives independent verification because such data is under constant review as part of unit inspections and surveys by the Navy Maintenance Support Office, the Navy Management Systems Support Office, Fleet Commanders, and Navy Air Systems Command. While we recognize that there are other maintenance work load reviews, we saw no evidence that they deal with the accuracy of maintenance task time data.

Work Load Allowances

SQMD program officials indicated that the documented work load of maintenance work centers does not adequately account for the total time required of a work center in performing required maintenance. In order to compensate for this, certain allowances are added to the maintenance work load:

- A productivity allowance is applied to productive work hours to reflect delays caused by worker fatigue, environmental effects, personal needs, and unavoidable interruptions. A factor of 20 percent is applied to such

productive work as planned maintenance, administrative support, facilities maintenance, and utility tasking.

- A production delay allowance is applied to corrective and planned maintenance to reflect delays such as awaiting parts, transportation, support equipment, technical assistance, inclement weather, and other phenomena that cause work to stop. The factor varies from 0 to 35 percent, depending on the individual work centers.
- A make-ready/put-away allowance is applied to the total prescribed planned maintenance manhours per work center. A factor of 30 percent is added for time spent obtaining and replacing instruction manuals, tools, and materials; transit to and from the work area; removal of interference; and necessary cleanup.

We found that these allowances are higher than those cited by DOD, were not based on engineered studies, were not reviewed, and were improperly applied.

Productivity Allowance

As support for its use of a 20-percent productivity allowance rate, the Navy referred us to a textbook on work measurement.[6] While this source, as well as additional materials we examined, generally support the use of a productivity allowance, it does not justify a 20-percent rate. Rather, it recommends that this allowance should be developed and documented using appropriate work measurement techniques, as in the establishment of any allowance. This means that the percentage factor could vary, depending on the type of operation studied. We believe that the Navy should conduct an engineered work measurement study to determine and document what a reasonable productivity allowance should be.

Production Delay Allowance

The production delay allowance is used to account for squadron maintenance personnel not being productively employed at all times. Adding additional time to work load to offset this situation increases the total maintenance work load used to compute maintenance manpower requirements.

The production delay allowance generally falls into the category of allowances referred to in DOD guidance as special delay allowances.[7] This

[6]Ralph M. Barnes, Work Sampling, New York: Wiley, 1957.

[7]DOD 5010.15.1-M, "Standardization of Work Measurement," June 13, 1977.

guidance states that no special delay-allowance percentage should be applied without an engineered backup study.

According to maintenance personnel in two squadrons and SQMD personnel, production delays are normally included in the time reported for performing a given maintenance action so long as the delay time does not exceed one hour. Also, when delays reach an hour squadron work center supervisors usually assign their people to other jobs so that they do not stand idle. Furthermore, Navy officials have no engineered backup studies supporting the need for this allowance. They said that an engineered study was performed when the allowance was established in the 1970s, but that the study is no longer available and has not been updated since the allowance was established.

In the absence of any quantitative data or studies demonstrating the validity of the allowance, the Navy is in a position of not being certain that such an allowance is needed or how much it ought to be. We believe that the Navy should perform an engineered work measurement study to determine whether its production delay allowance is required.

Make-Ready/Put-Away Allowance

According to Navy officials, the amount of time established for each planned maintenance task is measured from start of work to completion, exclusive of time needed to prepare for work or to clean up the area when work is finished. NAVMEC currently adds a 30-percent make-ready/put-away allowance to the anticipated time for performing each required planned maintenance task. This assumes that there is a make-ready/put-away action before and after each individual task. However, maintenance workers normally do not perform make-ready/put-away actions before and after each task. Instead, they generally perform only one make-ready/put-away action per work shift or per group of tasks such as a particular type of inspection. It would seem to be more reasonable to give credit for make-ready/put-away actions based on the number and duration of such actions rather than the number of individual tasks.

The DOD work measurement guidance concerning work load allowances provides for a make-ready/put-away allowance of no more than 4.2 percent. This allowance is based on one make-ready session at the beginning of a work shift and one put-away session at the end of the shift. While this may be too restrictive for squadron operations since several maintenance actions may be completed in a given work shift (especially on carriers where the normal maintenance work shift is 12 rather than 8

hours), a 30-percent make-ready/put-away allowance of almost 2 hours for make-ready/put-away activities per 8-hour shift of planned maintenance seems excessive. We believe that the Navy should conduct an engineered study to determine and document how much time should be allowed for the make-ready/put-away work load allowance.

Review of Allowances

None of the aircraft squadron work load allowances have been reviewed since their establishment about 10 years ago. As best we could determine from our discussions with various Navy officials, the productivity allowance percentage was reportedly adopted from private industry, and the production delay and the make-ready/put-away allowance percentages were developed by a team of SQMD analysts who visited a number of aircraft squadrons to perform extensive work measurement studies. Because limited records are available documenting the procedures, analyses, and results of the original development process, however, we could not verify that work measurement studies were done.

DOD and Navy criteria require that data elements used in calculating manpower requirements be kept current. DOD criteria cites a 3-year update interval. Navy guidance requires that allowances be kept current but does not specify how frequently allowances should be updated. The Navy guidance also requires that supporting documentation be retained to aid in the periodic reassessments and revalidations of allowances. Although age does not automatically mean that allowances are no longer accurate, the absence of reviews and the lack of supporting data place the Navy in a position of being unable to ensure the accuracy of the allowances. We believe that the Navy should establish a policy specifying the frequency for reviewing squadron work load allowances in accordance with DOD guidance. In addition, the need for documentation to support the allowances should be reemphasized.

Application of Work Load Allowances

NAVMEC's computer application of squadron work load allowances on planned maintenance work load data uses a formula that results in an inappropriate compounding of the data. As currently programmed, the computer calculates the total planned maintenance work load by multiplying the base planned maintenance work load (expressed in hours) by the make-ready/put-away allowance and then multiplying the result of this calculation by the sum of the productivity allowance and the production delay allowance—total PM=(base PM)x(1+MR/PA)x (1+[PA+PD]). This creates a compounding effect, the net result of which is that planned maintenance work load is inflated by at least 6 percent

and by as much as 16.5 percent in work centers where the full 35-percent production delay allowance is used.

Logically, this compounding of allowances appears inappropriate. For example, applying the productivity allowance to the make-ready/put-away allowance implies that such factors as worker fatigue and personal needs will cause delays in the workers' make-ready/put-away activities. However, this seems unlikely, particularly during the make-ready portion of a worker's activities at the start of a shift. Likewise, applying the production delay allowance to the make-ready/put-away allowance implies that workers will also experience delays in performing this part of their work. This seems to be double counting since supervisors with idle workers would probably have them preparing their work area or cleaning up.

With this compounding, the total work load allowances can exceed 100 percent of the base work load. For example, in a work center having 200 hours of planned maintenance work load and where the maximum 35-percent production delay allowance is used, the total allowance percentage applied to the base work load should total 85 percent (the 20-percent productivity allowance plus the 30-percent make-ready/put-away allowance plus the 35-percent production delay allowance equaling 85 percent). However, the actual allowance percentage would be 101.5 percent of the base work load because of the compounding effect. That is, while the productivity allowance is nominally 20 percent, the effective percentage turns out to be 26 percent because it is applied after time for make-ready/put-away has been added to the base work load. The production delay allowance is similarly computed, changing the maximum nominal rate of 35 percent to an effective rate of 45.5 percent. (See table 2.2.)

Table 2.2: Application of Work Load Allowances to Planned Maintenance Work Load

Computation	Allowance	
	Nonproductive hours	Effective percentage
30% make-ready/put-away allowance times 200 hours base work load	60	30.0
20% productivity allowance times 260 hours (base work load plus make-ready/put-away allowance hours)	52	26.0
35% production delay allowance times 260 hours (base work load plus make-ready/put-away allowance hours)	91	45.5
Total	**203**	**101.5**

Improper compounding of work load allowances can distort the accuracy of manpower requirements. For example, we found that the base planned maintenance work load for a training squadron before the application of any work load allowances totaled 409.27 hours a week. NAVMEC's computer applied the work load allowances to include the compounding effect described above, resulting in total planned maintenance hours of 602.74 a week. We recomputed the application of allowances, eliminating the compounding. Our computation resulted in total planned maintenance hours of 576.61 a week—a difference of 26.13 hours. We believe that the Navy should modify the NAVMEC computer model to eliminate the improper compounding effect of work load allowances.

Agency Comments and Our Evaluation

DOD agreed that the production delay allowance is insufficiently documented and stated that it will be deleted from all SQMD manpower requirements calculations by the end of fiscal year 1987, unless the need for it can be fully documented. DOD agreed that the amount of all allowances is not now supported by full documentation and said that studies will be undertaken to revalidate the level of all allowances by the end of fiscal year 1989.

DOD stated that, although the instruction on work load allowances does not sufficiently describe productivity-limiting conditions appropriate to the actual conditions of work performance experienced in deployed Navy squadrons aboard ship or at shore facilities, at least a 20-percent productivity allowance for squadron work can be reasonably derived. However, DOD provided no additional specific support for the use of a generalized productivity allowance of 20 percent.

Navy Workweeks

The Navy standard workweek for squadron manpower planning purposes depends on whether a squadron is assigned to an aircraft carrier or to an air station. For carrier-based squadrons, the standard workweek is 70 hours; and for shore-based squadrons, it is usually 40 hours. As shown in table 2.3, these workweeks are adjusted to compensate for the time individuals are expected to be unavailable to perform their duties, thus determining the amount of productive time available in a week. The total productive workweek hours are used to calculate aircraft squadron ground enlisted manpower requirements.

Table 2.3: Squadron Productive Workweeks (Hours)

	Carrier-based squadrons	Shore-based squadrons (where dependents are authorized)	Shore-based squadrons (where dependents are not authorized)
Standard workweek	70.00	40.00	57.00
Training	−3.50	−1.83	−3.00
Service diversion[a]	−3.50	−3.00	−3.00
Leave	[b]	−1.85	[b]
Holidays	[b]	−1.38	[b]
Net productive workweek	**63.00**	**31.94**	**51.00**

[a]Service diversion includes miscellaneous actions such as sick call.

[b]Productive workweeks do not consider leave or holidays while at sea or at shore activities where dependents are not authorized.

We found that the Navy has no documentation supporting its workweeks and that the accuracy of its at-sea and shore-activities workweeks has been questioned.

Documentation for Workweeks

According to a 1979 Naval Audit Service report, the productive workweek for carrier-based squadrons was established in 1967, or about 20 years ago, in order to be more consistent with the ship's standard workweek.[8] The validity of the ship's workweek, however, is not necessarily a valid standard. It was reportedly developed by a Navy ad-hoc group without any direct input from ship commanding officers. The productive workweek for shore-based squadrons was established in the mid-1960s using time allowances that were determined judgmentally.

The Navy could provide no documentation to support the accuracy of Navy workweek figures. According to a Navy official, the workweek figures represent "a best guess," and the Navy performed no in-depth, scientific studies in initially developing these figures.

According to DOD work measurement specialists, the Navy's workweek figures should be updated because of the long time period that has elapsed since they were established. Also, during our work, SQMD validation team members told us that the Navy at-sea workweek figures are not representative of actual conditions.

[8]Review of Navy Military Strength and Manpower Management (Naval Audit Service, Audit Report C37128, April 10, 1979).

At-Sea Workweek

The 1979 Naval Audit Service report cited a 1975 Navy Personnel Research and Development Center report,[9] which stated that the standard workweek for carrier-based squadrons understates the actual number of hours worked by these squadrons. In addition, the Naval Audit Service report stated that the at-sea workweek hours were routinely exceeded.

The Naval Audit Service report recommended that the Navy conduct a study aimed at revising the standard at-sea workweek used for calculating manpower requirements. In responding to this recommendation, the Navy said that such a study would not be cost-beneficial because of the typical variance between manpower authorizations and requirements. Since, at that time, about 15 percent fewer positions had been funded than needed, the Navy saw no need for changes to the at-sea workweek. A CNO aviation manpower analyst told us, however, that currently the Navy funds nearly all manpower requirements for operating forces, including carrier-based squadrons.

The use of an understated standard workweek results in an overstatement of manpower requirements. The 1979 Naval Audit Service report estimated that, because of this problem, carrier-based squadron manpower requirements were overstated by 7 percent (2,100) which, if funded, would cost $21.2 million a year at that time (based on fiscal year 1979 budget figures of $10,096 per funded military position).

Shore-Activities Workweek

According to the 1979 Naval Audit Service report, the Navy recognized differences in the Navy and Air Force productive workweek time factors for shore activities in 1975; and, being unable to substantiate the reason for the differences, requested that the Navy Personnel Research and Development Center determine whether shore-based Navy people had less time available for productive work than comparable people in other military services. The study concluded that the Navy's productive time factor for shore activities was understated. In 1979, the Naval Audit Service updated the Navy Personnel Research and Development Center study, finding again that the Navy productive time factor was too low. The Naval Audit Service report supported a time factor which, at that time, was about the same as the Air Force's factor. Any misstatement of productive time distorts the Navy's calculated manpower requirements. According to the 1979 Naval Audit Service report, the Navy, in not using

[9]Investigation of the Navy Workweek at Sea (Navy Personnel Research and Development Center, Special Report 76-2, Sept. 1975).

the updated Navy Personnel Research and Development Center time factor, overstated manpower requirements by 4,750 positions. At that time, this amounted to about $48 million a year in potential savings.

The Navy Personnel Research and Development Center recently completed a study of one shore-based workweek element, the "service diversion" time factor of the shore-based standard workweek. The Navy is now in the process of increasing its shore activities productive workweek from 31.94 hours to 33.38 hours per week. We believe that the Navy should similarly reevaluate the validity of all its standard workweeks.

Agency Comments and Our Evaluation

DOD stated that all Navy workweek factors used for sea and shore manpower planning were updated in OPNAVINST 1000.16F (Manual of Navy Total Force Manpower Policies and Procedures) in August 1986. The standard workweeks for carrier-based and shore-based combat squadrons are now more representative of actual experience in the field. DOD stressed, however, that it should be recognized that the standard workweeks represent manpower planning factors for what "should be" not necessarily "what is" since peacetime observations of operations cannot fully describe how work should be performed in wartime. For noncombat squadrons and other shore activities, the Navy standardized the workweek to coincide with the recent documented workweek studies of the other services.

Limited Program Support Is a Possible Contributor to SQMD Problems

During the course of our review, we observed a number of areas where limited program support may be contributing to some of the problems we found. In particular we found that

- insufficient travel funds reportedly do not allow SQMD analysts to gather data from a representative sample of squadrons;
- fewer personnel have been assigned than authorized;
- staff turnover is high and personnel assigned to the program often lack manpower experience; and
- the training provided for personnel assigned to the program does not meet operational needs.

While analyzing these support issues in detail was beyond the scope of this review, these issues should be examined to ensure that they do not adversely affect the Navy's efforts to improve the SQMD program. If they are adversely affecting the program, converting some positions to

civilian positions and instituting a Navy manpower career field might help remedy these problems.

Insufficient Travel Funds Reportedly Hamper Data Gathering

Since most efforts to develop and review staffing standards necessitate research and data collection at multiple locations, travel costs can be significant. However, because of insufficient travel funds, SQMD analysts report that they have been largely confining their data-gathering efforts to two local Naval Air Stations. Data gathered at only two locations in a single geographic area does not ensure that the results will be sufficiently representative of all Navy squadrons, thereby undermining the accuracy of the standards review function.

Fewer Personnel Have Been Assigned Than Authorized

To be effective, a manpower determination program must be adequately staffed. We found that the SQMD program, however, was staffed with fewer people than the number authorized to operate the program. Although the SQMD program was authorized 31 positions, only 24 of those positions (77 percent) were filled as of March 1985. The Validation Branch had filled 4 of 6 (67 percent) of its authorized positions, and the Standards Review Branch had filled only 4 of 9 (44 percent) of its authorized positions.

Not only has the SQMD program not received its full authorization of personnel, some important positions were vacant. For example, we found that the Standards Review Branch had no full-time person in charge, the previous officer-in-charge having rotated to a new assignment over a year ago. At the time of our review, the officer-in-charge of the Development/Analysis and Production Branch was also responsible for the Standards Review Branch. According to this officer, such collateral duty arrangements make it difficult to devote the time, effort, and leadership necessary to ensure that reviews of SQMD staffing standards are performed.

Personnel Lack Manpower Experience

SQMD staff turnover is high, and most SQMD personnel lack previous manpower experience, with 60 percent of the officers and 79 percent of the enlisted personnel having no previous manpower experience. Also, none of the enlisted people assigned to the SQMD program at the time of our review had worked there previously.

Staff turnover in the SQMD program is extensive for two reasons. First, 63 percent of the enlisted personnel assigned to the SQMD program are

enlisted personnel (grades E-7 through E-9) with very little time left in the service, and they are less likely to serve additional tours in the manpower area. A second reason for the high turnover is that all the personnel assigned to the program are military personnel, who usually rotate at 2- to 3-year intervals. For example, a total of 10 people (about one-third of the staff) left the program between October 1984 and September 1985—about an 11-month period.

SQMD program officials expressed concern that the high turnover causes a great loss in productivity resulting from lack of corporate knowledge and the constant training requirement. One officer also noted that personnel leaving the program seldom have time to properly orient their replacements.

Personnel Lack Specialized Training

Lacking experience, SQMD personnel need specialized training. However, most personnel in the SQMD program lack such training. On arrival at NAVMEC, enlisted personnel take the NAVMEC Manpower Engineering Technician training course. The SQMD enlisted personnel in the Development/Analysis and Production Branch and the Validation Branch said that the course is of limited benefit in preparing them to perform their specific duties in the SQMD program. They explained that the course includes little information specifically related to the SQMD program and includes nothing on the procedures for developing and reviewing squadron manpower requirements or for validating squadron requirements on site.

The Manpower Engineering training course is now being modified to make it more beneficial to SQMD personnel. Under the modified program, SQMD personnel will attend the first 6 weeks of the existing training course to obtain an understanding of manpower staffing standards development techniques. Then, for 2 weeks, their training will be directed toward specific duties and responsibilities of the SQMD program. SQMD personnel have developed draft lesson guides outlining the training to be given during the final 2-week period. Items to be covered include SQMD development, analysis, and production; validation procedures; squadron manpower and manning documents; and use of the SQMD procedures manual.

SQMD Program Has No Civilian Positions

One possible solution to the problems posed by the lack of experience and training of SQMD personnel may be to civilianize some positions which could provide increased staff continuity and a better chance of getting staff with the manpower planning skills and experience.

SQMD personnel said that some positions could readily be civilianized, particularly positions which do not require visits to squadrons and direct interaction with squadron personnel. However, they also said that military personnel drawn from aircraft squadrons should continue to be used in areas where their squadron experience makes them better able to understand squadron functions and to validate squadron manpower needs.

Navy Has No Career Manpower Field

Another proposal that has been offered to improve experience and training of personnel in the manpower area is that the Navy institute a manpower career field for military personnel. The Congress expressed a desire for the Navy to have a manpower career field in its April 1977 House report on fiscal year 1978 DOD appropriations. In that report, it stated that "the Navy would benefit by creating a definite career pattern for personnel to pursue in the manpower area which would of itself be career enhancing."

At present, the Navy relies on the Navy Enlisted Classification system and the Officer Subspecialty system to provide the required manpower personnel. The objective of the Navy Enlisted Classification system is to identify enlisted personnel who, through training or experience, have obtained specialized skills and knowledge, in addition to their primary skill area. For example, enlisted personnel may have a primary job skill of aviation mechanic or electronics technician; but, by attending certain specified training courses or working in an area for a given amount of time, they can obtain additional skills in areas such as manpower.

The Navy Officer Subspecialty system is aimed at allowing the Navy to track and utilize officer expertise in functional areas such as manpower. Most officers have both a primary specialty, such as submarine or surface warfare, and one or more subspecialties, such as personnel or intelligence. Navy officials say that they make an effort to assign officers to shore duty in positions requiring their subspecialties.

The high turnover, lack of experience, and lack of training we found may indicate that neither the enlisted nor the officer system is working to ensure that fully capable personnel with sufficient manpower-related experience are assigned to the SQMD program. One possible reason for this, according to CNO manpower representatives, is that the Navy has not strictly adhered to its policy of assigning personnel to the SQMD program with specialized manpower skills.

In several previous reviews, we have recommended the establishment of a career field for military personnel in the manpower area.[10] The Navy, however, has consistently rejected these recommendations since it believes that the Navy Enlisted Classification and Officer Subspecialty systems are adequate.

We continue to believe that the Navy's manpower program is hindered by the lack of a manpower career field for military personnel. Our examinations of all three of the Navy's manpower requirements programs has revealed limited manpower experience and high turnover among the programs' staff. We believe that staffing the manpower area with personnel who have manpower as either a subspecialty or a secondary skill requires the Navy to pull these people out of operational units where their skills may be in high demand. Establishment of a manpower career field could, therefore, allow these personnel to continue working in their primary field. Also, it would allow people in the manpower area to develop greater professionalism through routine retouring and providing career incentives. In a recent report on the capabilities of personnel in the systems acquisition field, we recommended that the Navy establish a career field in the acquisition area.[11] DOD concurred with that recommendation. We believe that the case for a career field in the manpower area is as compelling as the case for systems acquisition personnel.

Agency Comments and Our Evaluation

DOD did not agree that a lack of travel funds has prevented gathering data from representative squadrons, stating that travel funding is sufficient for the tri-annual review of all squadron staffing standards and other factors. This conflicts with what has been reported by SQMD analysts. We did not attempt to reconcile this conflict; however, if SQMD analysts are collecting data from only two locations in southern California, there is no assurance that the results will be sufficiently representative of operations at other bases in other regions or climates.

[10]See Military and Civilian Managers of Defense manpower: Improvements Possible in Their Experience, Training, and Rewards, Vol. I and II, (GAO/FPCD-80-29, Feb. 16, 1979); The Navy's Shore Requirements, Standards, and Manpower Planning System (SHORSTAMPS)—Does the Navy Really Want It? (GAO-FPCD-80-29, Feb. 7, 1980); Navy Manpower Management: Continuing Problems Impair the Credibility of Shore Establishment Requirements (GAO/NSIAD-85-43, Mar. 7, 1985).

[11]DOD Acquisition: Strengthening Capabilities of Key DOD Personnel in Systems Acquisition (GAO/NSIAD-86-45, May 1986).

DOD agreed that the number of personnel assigned to the SQMD program, personnel turnover and experience, and the quality of training have contributed to the lack of full program documentation. As part of a recent restructuring of staff, the SQMD program has been alloted a number of civilian positions in order to provide increased staff continuity and manpower-related experience. Most authorized military billets are now filled, and a formal NAVMEC training course for SQMD analysts has begun. DOD did not agree that the Navy should establish a manpower career field for military personnel, noting that the Navy would continue to use its Officer Subspecialty and Enlisted Classification systems to provide manpower management personnel. Since these systems have not prevented the high turnover, inexperience, and lack of training we found among the personnel in the SQMD and other manpower programs, we believe that this issue still needs to be addressed.

Conclusions

Aircraft squadron capability and personnel costs depend on an accurate, reliable SQMD program for determining the manpower requirements of squadrons. Although the SQMD program appears to be conceptually sound, improvements need to be made in a number of areas. We found that problems exist in how the Navy

- establishes squadron manpower requirements;
- develops, reviews, and documents staffing standards, work load allowances, and workweek time factors; and
- measures and documents some maintenance work loads.

Recommendations

We recommend that the Secretary of the Navy direct that

- efficiency reviews be performed before developing or updating staffing standards;
- staffing standards be developed for as many position requirements as practical, both officer and enlisted;
- staffing guidelines be developed for those officer and enlisted positions where staffing standards are seen as impractical (such guidelines including the process for establishing positions, documenting their justification, and periodically reevaluating the need for them);

- the SQMD standards application process be improved to ensure the accuracy of maintenance work load by actions such as
  - using acceptable work measurement techniques to establish anticipated time for performing aircraft planned maintenance tasks, and
  - requiring an independent, periodic review of maintenance documentation, at the squadron level (such review including validation of historical maintenance data by analyzing other materials related to work load);
- studies be conducted to determine the appropriate time allowances to be added to measured work load;
- staffing standards and guidelines, work load allowances, and workweek time factors be validated periodically in accordance with DOD guidance; and
- the SQMD computer model be revised to
  - allow certain squadron indirect maintenance work load (facilities maintenance and utility tasking) to be allocated at least on a department-wide basis where feasible, and
  - eliminate the compounding effect of work load allowances.

In addition, we recommend that the Secretary of the Navy require that current, accurate, and complete documentation be maintained to support the

- methodology for establishing squadron manpower requirements;
- staffing standards, work load allowances, and workweek time factors;
- squadron work load data used in calculating manpower requirements; and
- assumptions of the SQMD computer model.

Agency Comments and Our Evaluation

DOD officials stated that this report has already proved useful to DOD in making refinements to the Navy's manpower program and the Navy has already implemented many of our recommendations. However, they were concerned that readers might be left with the impression that the SQMD process generates excessive requirements. We could not determine, due largely to inadequate documentation, whether squadron requirements are accurate or not. Several of the problems we found—particularly in the areas of maintenance work load, work load allowances, and workweek factors—could be expected to produce higher stated requirements, but there could also be areas where SQMD requirements are understated.

DOD agreed with most of our recommendations and described Navy actions to address them, noting that review of functions for potential efficiencies will be an integral part of the standards development process, and expanded guidance on this policy will be incorporated in the NAVMEC SQMD Procedures Manual scheduled for reissue in July 1987.

DOD also agreed that staffing standards should be developed for as many positions as feasible and that documented guidelines be developed to establish and justify those positions not amenable to the use of staffing standards. The CNO has tasked NAVMEC to develop a ground officer staffing standard. A plan of action to complete staffing standards for all applicable officer and enlisted positions will be approved by the CNO by the end of fiscal year 1987 and will provide for completion of all standards by the end of fiscal year 1989. The CNO also directed NAVMEC to identify all positions where the use of staffing standards is impractical and to complete documentation of staffing guidelines by the end of fiscal year 1987.

With regard to our recommendation to improve the accuracy of maintenance work load data, DOD only partially agreed. DOD agreed that a rigorous, periodic review of squadron historical maintenance documentation is appropriate. Emphasis on this aspect of the manpower requirements development process and standardization of procedures for calculating corrective maintenance will be included in the July 1987 reissue of the NAVMEC SQMD Procedures Manual. DOD did not agree, however, that work load measurement techniques should be applied to planned maintenance tasks which are developed by the Naval Air Systems Command.

We found no evidence indicating that the data on planned maintenance received from the Naval Air Systems Command was actually developed through the use of work measurement techniques. Rather, we found that planned maintenance data is based primarily upon judgment. Since planned maintenance represents a sizeable portion of a squadron's maintenance work load and is critical to maintaining squadron readiness, it needs to be as accurate as practical.

DOD agreed that studies should be done to determine the appropriate time allowances to be added to measured work load. DOD noted that the production delay allowance will be deleted by the end of fiscal year 1987 from application to any measured work load, unless an engineered study validating it is available. The make-ready/put-away and productivity allowances will continue to be applied, but NAVMEC will undertake

additional studies to fully document the correct level of these allowances. These studies are expected to be completed by the end of fiscal year 1989.

In addition, DOD agreed that periodic review of staffing standards, guidelines, and allowances is necessary. The CNO has directed NAVMEC to incorporate a tri-annual review of these elements in the July 1987 reissue of the SQMD Procedures Manual. Review of the workweek factor is now being done as part of the annual review of Navy Total Force Manpower policies and procedures.

DOD also agreed to modify the SQMD computer model stating that the CNO has directed NAVMEC to allow utility tasking and facilities maintenance work load to be allocated on a department-wide basis by the end of fiscal year 1987. With regard to the compounding effect of the way the work load allowances were calculated, DOD agreed that the application of the productivity allowance to planned maintenance was incorrect and stated that it has already been eliminated. However, DOD disagreed with the suggestion in our draft report that the administrative support portion of indirect maintenance work load be allocated beyond the workcenter. DOD pointed out that the portion is largely comprised of personnel management and unit leadership functions which cannot be appropriately spread across workcenter lines. We agree that these functions should be retained within the workcenter and our final report has been modified to recommend that only the facilities maintenance and utility tasking portions of indirect maintenance work load be spread across workcenter lines.

Finally, DOD agreed that more complete and current documentation should be maintained. The CNO has directed NAVMEC to develop and maintain full documentation validating the establishment of all position requirements whether based on staffing standards, guides or other methods. Also, the SQMD Procedures Manual will be reissued in July 1987 to include rigorous documentation of position requirements and planned studies will refine work load allowances. The CNO has also instituted an annual program review in which the adequacy of requirements documentation and all elements of the SQMD program will be fully examined for conformance with approved procedures. A review of Navy workweek factors has been completed and incorporated in OPNAVINST 1000.16F. Complete documentation of the SQMD computer model is already contained in the NAVMEC Navy Manpower Requirements System (NMRS) Users Manual.

Organizations Contacted During Our Review

Manpower Activities	Office of the Secretary of Defense, Washington, D.C. Office of the Chief of Naval Operations, Washington, D.C. Navy Manpower Engineering Center, Norfolk, Virginia Navy Manpower Engineering Center Detachment, San Diego, California
Logistics Activities	Naval Air Systems Command, Washington, D.C. Naval Aviation Logistics Center, Patuxent River, Maryland Naval Air Rework Facility, Norfolk, Virginia Naval Air Rework Facility, San Diego, California Navy Maintenance Support Office, Mechanicsburg, Pennsylvania
Operational/Training Activities	Commander-in-Chief, U.S. Atlantic Fleet, Norfolk, Virginia Commander, Naval Air Force, U.S. Atlantic Fleet, Norfolk, Virginia Commander, Naval Air Force, U.S. Pacific Fleet, San Diego, California Commander Fighter Wing One, Naval Air Station, Oceana, Virginia Beach, Virginia Fighter Squadron One Four Two, Naval Air Station, Oceana, Virginia Beach, Virginia Fighter Squadron One Four Three, Naval Air Station, Oceana, Virginia Beach, Virginia Attack Squadron Thirty Four, Naval Air Station, Oceana, Virginia Beach, Virginia Attack Squadron Forty Two, Naval Air Station, Oceana, Virginia Beach, Virginia Helicopter Combat Support Squadron One, Naval Air Station, North Island, San Diego, California Training Squadron Four, Naval Air Station, Pensacola, Florida
Air Force	Tactical Air Command, Langley Air Force Base, Virginia
Airline Companies	Delta Air Lines, Inc., Atlanta, Georgia United Airlines, San Francisco, California
Aircraft Manufacturers	Grumman Aerospace Corporation, Integrated Logistics Support, Virginia Beach, Virginia McDonnell Aircraft Company, St. Louis, Missouri

An Illustration of How Refinements in Methodology and Assumptions Used by the SQMD Program Could Change Wartime Manpower Requirements

For the purpose of illustration, we modified several assumptions incorporated in the SQMD computer model to levels which may be reasonable alternatives to the current assumptions. We recognize that the assumptions we substituted are not based on industrial engineering studies, and we are not advocating that the Navy use them. More rigorous analysis is needed to determine what assumptions are appropriate. The purpose of this illustration, however, is to demonstrate the sensitivity of calculations of manpower requirements to the underlying assumptions and to reinforce the need for attention to manpower determination methods. Within the scope of this review, however, we could not determine precisely the degree to which correcting the problems with staffing standards, allowances, and workweeks would affect the overall number of squadron manpower requirements.

For illustrative purposes, we recomputed the ground enlisted manpower requirements for three of the largest types of carrier-based squadrons—F-14A, A-7E, and A-6E/KA-6D squadrons—to see how changing several of the assumptions the Navy uses would affect these requirements. In performing our analysis, we had NAVMEC adjust the existing work load allowance factors and recompute manpower requirements.

Then, we made manual adjustments to certain computational algorithms. More specifically, we

- reduced the productivity allowance from 20 percent to 15 percent, as estimated by a DOD work measurement specialist;
- eliminated the production delay allowance since DOD guidance states that such an allowance should not be applied without an engineered backup study;
- reduced the make-ready/put-away allowance from 30 percent to 9 percent, which is still over twice the percentage cited in DOD guidance;
- modified the computational method for applying work load allowances to eliminate the compounding effect; and
- modified the computational method for accumulating indirect maintenance work load to be absorbed by squadron departments rather than each work center in a department, as the Navy agreed to do in a similar situation concerning indirect maintenance on ships.

Tables II.1 and II.2 show the results of our recomputation based on these assumptions. The total computed reductions exceed the sum of the individual reductions because the factors in some cases are dependent on each other. Therefore, the reductions generated by one factor reduce requirements driven by other factors.

Table II.1: Effect of Adjusting Some Data Elements Used in Determining Squadron Requirements

	Positions reduced by type of aircraft		
Variables	**F-14A**	**A-7E**	**A-6E**
Reduction of productivity allowance to 15 percent	0	0	2
Elimination of production delay allowance	10	16	13
Reduction of make-ready/ put-away allowance to 9 percent	2	3	4
Elimination of compounding of allowances	1	2	6
Allowing indirect work load to be spread across work center lines	1	1	2
Total combined reduction	**22**	**28**	**31**

Table II.2: Summary of Differences in Requirements Resulting From Changes in Assumptions and Methodology

	Type of squadron		
	F-14A	**A-7E**	**A-6E**
Standard SQMD	267	270	284
Alternate SQMD using substitute assumptions	245	242	253
Difference between standard SQMD and the alternate SQMD	**22**	**28**	**31**
Percentage reduction	8.2	10.4	10.9

As shown, the percentage of manpower requirements reductions ranges from about 8 percent to 11 percent.

Letter From the Principal Deputy, Office of the Assistant Secretary of Defense (Force Management and Personnel)

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301-4000

FORCE MANAGEMENT AND PERSONNEL

30 JAN 1987

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

Dear Mr. Conahan:

This is the Department of Defense (DOD) response to the General Accounting Office (GAO) Draft Report, "NAVY MANPOWER: Squadron Manpower Program Needs Improvement," Dated December 10, 1986 (OSD Case 7182) GAO Code 967126.

The GAO report has already proved useful to the DOD in making refinements to the Navy Manpower Engineering Program. The DOD is, however, concerned with the overall impression left by the report--i.e., that the Squadron Manpower Document (SQMD) process generates excessive requirements. The report also implies that manpower requirements can only be validated through engineered studies. On the contrary, the Navy's SQMD Program uses the latest and best of a variety of appropriate techniques in developing manpower requirements. The Department does agree fully with the GAO that more attention needs to be given to refinement of documentation procedures.

In addition, the report notes that many SQMD requirements are "directed" by the Chief of Naval Operations, and implies that these are, therefore, invalid both in quality and quantity. In fact, these requirements have received extensive corporate scrutiny in every case, and are being rigorously verified by SQMD analysts during on-site manpower surveys using work measurement techniques.

Furthermore, the GAO draft report is based on information obtained in a review conducted over a several year period. The Navy has already initiated action to accomplish many of the recommended refinements. All workload allowances, for example, have either been deleted or scheduled for study, the Navy standard workweeks have been revised, and improved documentation procedures have been instituted. These refinements and initiatives, plus others, represent substantial progress in the Navy's manpower requirements determination programs.

The SQMD Program is complex and dynamic and some minor problems will persist; however, the Navy is continually reviewing the program and correcting the problems with the goal of establishing the most accurate manpower requirements feasible.

Detailed responses to the draft report findings and recommendations are enclosed.

Sincerely,

David J. Armor
Principal Deputy

Enclosures:
As Stated

GAO DRAFT REPORT - DATED DECEMBER 10, 1986
(GAO CODE 967126), OSD CASE 7182

"NAVY MANPOWER: SQUADRON MANPOWER PROGRAM NEEDS IMPROVEMENT"

DEPARTMENT OF DEFENSE COMMENTS

* * * * *

FINDINGS

- FINDING A: Squadron Manpower Document Program. The GAO observed that the Navy established the Squadron Manpower Document (SQMD) program in 1969, to determine and document the minimum manpower requirements for all active-duty and most reserve aircraft squadrons. The GAO also observed that as of May 1986, the program covered approximately 85,000 positions--about 14,000 officers and about 71,000 enlisted personnel--representing personnel cost of about $2 billion annually. The GAO noted that the responsibility for the overall control and direction of the program lies with the Deputy Chief of Naval Operations (CNO) for Manpower, Personnel, and Training, within the Office of the CNO. The program is supported by the Navy Manpower Engineering Center (NAVMEC), which develops and applies staffing criteria. (pp. 6-9/GAO Draft Report)

  DOD RESPONSE: Concur. The DOD concurs with the general description of the SQMD program contained in this finding.

- FINDING B: Navy Has No Staffing Standards for Many Positions. The GAO noted that squadron manpower requirements, other than those for flight crews, are either derived from staffing standards or are directed by the CNO. The GAO also noted that staffing standards are mathematical equations, which determine the number of positions needed, based on measured or projected work load; and that directed requirements are those which exist by the direction of the CNO rather than being associated with a particular measurable workload. The GAO found that all ground officer requirements and almost 20 percent of ground enlisted requirements are directed by the CNO and are not based on staffing standards using measured work load. The GAO also found that the Navy has no written procedures for the establishment of these directed requirements and no documentation for the procedures used to establish them. In addition, the GAO found that the ground officer requirements are reportedly based on historical precedent, subjective judgements, and the available inventory of ground officers in the Navy as a whole. (p. 2, pp. 12-17/GAO Draft Report)

Enclosure

Now on pp. 8 to 9.

Now on pp. 3 and 12 to 15.

DOD RESPONSE: Partially Concur. The DOD agrees that staffing standards and improved documentation procedures for ground officers and some enlisted requirements are needed. In September 1985, the CNO directed NAVMEC to develop a ground officer staffing standard, the draft of which is planned to be available for fleet and CNO review in February 1987 and scheduled for CNO approval by October 1987. For ground enlisted requirements, specifically, the DOD agrees that written procedures and documentation need improvement, but the DOD does not concur that there is no present documentation for these requirements. Most ground enlisted requirements, not covered by staffing standards, are documented in various CNO Instructions with the advice and consent of the DCNO (MPT). These Instructions (such as OPNAVINSTs 4790.2D, 5400.37C and 1040.6A) establish CNO-directed functions in which NAVMEC is tasked to validate the associated workload and determine the specific quantity and skills of positions required. Improved guidelines and procedures will be accomplished by end FY 87 and pertinent standards developed by end FY 89.

- FINDING C: SQMD Program Data Elements Are Not Accurate. The GAO observed that in determining all other ground enlisted manpower requirements, NAVMEC uses a manpower modeling system whereby staffing standards and the projected weekly work load for a squadron work center are simulated on computers and, as part of this process, maintenance work load is increased by adding allowances to account for certain nonproductive time. According to the GAO, the total weekly required hours are then divided by the productive hours available in a week to derive the quantity of enlisted positions needed for a work center. The GAO found however, that the staffing standards that do exist are questionable and no documentation exists for the initial development of the staffing standards used for ground enlisted requirements, nor have the standards been periodically updated. The GAO also found that the Navy does not require that new or revised standards be based on efficiency reviews (studies of the most efficient method of performing a given task), as directed by DOD Instruction 5010.37, "Efficiency Review and Resource Requirements Determination." The GAO concluded that for the Navy to establish minimum squadron ground enlisted manpower requirements, such SQMD program data elements as staffing standards, work load data, work load allowances, and Navy workweek time factors must be accurate. (p. 2, pp. 17-20, GAO Draft Report)

Now on p. 3 and pp. 15 to 17.

DOD RESPONSE: Partially Concur. The DOD concurs that full supporting documentation of SQMD staffing standards has not been maintained and, in the past, staffing standards have not been formally reviewed on a rigorous, periodic basis. This has been corrected by CNO direction to NAVMEC in February 1986 to initiate a program to ensure standards are reviewed at least every 3 years in accordance with DOD guidance. This program is underway, and requires all new or revalidated

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standards submitted by NAVMEC for CNO approval to contain all supporting documentation and position justification for permanent files. This guidance will be formalized in the NAVMEC SQMD Procedures Manual to be reissued in July 1987. The DOD does not concur, however, that the referenced DOD Instruction 5010.37 requires methods studies in combat units such as squadrons prior to development of standards. The CNO is, however, applying the Efficiency Review/methods study procedures in the SQMD program to the maximum extent feasible. The SQMD process employs techniques to minimize workload inflation, duplication of tasks, inappropriate tasking, etc., in a similar manner to the DOD Efficiency Review process.

- FINDING D: Workload Accuracy Not Validated. The GAO noted that in determining an aircraft squadron's ground enlisted manpower requirements, NAVMEC must establish the squadron's work load. The GAO also noted that this work load is largely comprised of maintenance work, which generates about 62.5 percent of a squadron's ground enlisted manpower requirements and consists of three categories--corrective maintenance, planned maintenance and indirect maintenance. The GAO found that the ways in which these work loads are calculated are questionable and that work load data is inadequately documented and verified. The GAO cited, for example, the maintenance workload is based on data that is not independently verified and requirements are calculated inconsistently. Furthermore, the GAO found that the maintenance work load is not always documented or periodically reviewed. The GAO concluded that aircraft squadron capability and manpower costs critically depend on an accurate, reliable SQMD program for determining the minimum wartime manpower requirements of squadrons. The GAO also concluded that although the SQMD program appears to be conceptually sound, improvements need to be made in a number of areas, such as in how the Navy

  - Establishes squadron manpower requirements not based on work load (Finding B);

  - develops and reviews staffing standards, work load allowances, and workweek time factors (Finding C); and

  - measures some maintenance work loads (Finding D).

  In addition the GAO concluded that as long as these problems exists, the Navy will continue to have difficulty satisfying the Congress that its budget requests for aircraft squadron manpower are credible. (p. 2, pp. 20-28, op. 48/GAO Draft Report).

low on p. 3 and pp. 17 to 22.

DOD RESPONSE: Partially Concur. The DOD concurs that, in the past, the procedures for the regression of Corrective

Maintenance (CM) data was not fully standardized. In February 1986, the CNO directed the NAVMEC to develop a standardized, statistically valid procedure based on comprehensive maintenance data review and documentation. This development is on-going for completion by end of FY 87. Several interim improvements have been made based on analysis of procedures to date. The DOD also concurs that certain other refinements to the SQMD program regarding the establishment of positions not based on workload, and the development and review of standards, workload allowances and workweek factors are appropriate. The DOD does not concur, however, that CM data does not receive independent verification, since such data is under essentially constant review as a part of unit inspections and surveys by the Navy Maintenance Support Office (NAMSO), the Navy Management Systems Support Office (NAVMASSO), Fleet Commanders, and NAVAIRSYSCOM. Additionally, Preventive Maintenance (PM) requirements are generated by NAVAIRSYSCOM under Military Specification MIL-P-24534A and reviewed under NAVAIRINST 5600.20.

- FINDING E: Unverified Allowances Added to Workload Data. The GAO observed that, according to SQMD program officials, the documented work load of maintenance work centers does not adequately account for the total effort of a work center in performing required maintenance. In addition, the GAO noted that in order to compensate for this, certain allowances are added to the maintenance work load and include:

  - A productivity allowance that is applied to the productive work hours to reflect delays caused by worker fatigue, environmental effects, personal needs, and unavoidable interruptions. A factor of 20 percent is applied to such productive work as planned maintenance, administrative support, facilities maintenance, and utility tasking.

  - A production delay allowance that is applied to the corrective and planned maintenance to reflect delays such as awaiting parts, transportation, support equipment, technical assistance, inclement weather, and other phenomena which cause work to stop. The factor varies from 0-35 percent, depending on the individual work centers.

  - A make-ready/put-away allowance that is applied to the total prescribed planned maintenance manhours per work center. A factor of 30 percent is added for time spent obtaining and replacing instruction manuals, tools, and materials; transit to and from the work area; removal of interference; and necessary cleanup.

  The GAO concluded that these allowances exceeded DOD criteria (DOD Instruction 5010.15.1-M, Standardization of Work

Measurement), were not reviewed, and were improperly applied. The GAO also concluded that the allowances for nonproductive time added to maintenance work load have not been based on supportable evidence, may be excessive and need to be studied. (p. 2, pp. 28-36/GAO Draft Report)

Now on p. 3 and pp. 22 to 27.

DOD RESPONSE: Partially Concur. The DOD concurs that the Production Delay (PD) allowance is insufficiently documented and will be deleted from all SQMD manpower requirements calculations by end FY 87, unless the need for same can be fully documented at that time. The DOD also concurs that the amount of all allowances is not now supported by full documentation and studies will be undertaken to revalidate the level of all allowances by end FY 89. The DOD does not concur, however, that the present level or application of Productivity Allowance (PA) and Make Ready/Put Away (MRPA) Allowance is demonstrably excessive or incorrect. The referenced DOD Instruction does not provide sufficient description of productivity-limiting conditions appropriate to the actual conditions of work performance experienced in deployed Navy squadrons aboard ship or shore facilities; nevertheless, at least a 20% Productivity Allowance (PA) for squadron work can, in fact, be reasonably derived from these DOD factors. In a similar manner, the DOD Instruction provides for reasonable recognition of Make Ready/Put Away time, but the guidance discussion is appropriate only to the benign environment of production shift work ashore, not to the actual conditions experienced in squadron operations.

- FINDING F: Navy Workweek Estimates Not Supported. The GAO found that the Navy standard workweek for squadron manpower planning purposes depends on whether a squadron is assigned to an aircraft carrier or to an air station. The GAO noted, for example, that for carrier-based squadrons, the standard workweek is 70 hours; and for shore-based squadrons, it is usually 40 hours. The GAO found, however, that the Navy workweeks (net) used to determine manpower requirements (63 hours for carrier-based squadrons and about 32 hours for some shore-based squadrons) may not be accurate and are unsupported with reliable documentation, which has not been updated since they were established. (p. 2, pp. 36-41/GAO Draft Report)

Now on p. 3 and pp. 27 to 30.

DOD RESPONSE: Partially Concur. All Navy workweek factors used for sea and shore manpower planning were updated in OPNAVINST 1000.16F (Manual of Navy Total Force Manpower Policies and Procedures) in August 1986. The standard workweeks for carrier-based and shore-based combat squadrons are now more representative of actual experience in the field. It should be recognized, however, that these standard workweeks represent manpower planning factors for what "should be" not necessarily "what is," since peacetime observations of operations cannot fully describe how work

should be performed in wartime. For non-combat squadrons and other shore activities, Navy standardized the workweek in June 1986 (with DOD approval) to coincide with the recent, documented workweek studies of the other services.

- FINDING G: Limited Program Support Is A Possible Contributor To SQMD Problems. The GAO observed a number of areas where limited program support may be contributing to some of the SQMD problems. The GAO found that:

  - insufficient travel funds reportedly do not allow SQMD analysts to gather data from a representative sample of squadrons;

  - fewer personnel have been assigned than authorized;

  - staff turnover is high and personnel assigned to the program often lack manpower experience; and

  - the training provided for personnel assigned to the program does not meet operational needs.

  The GAO concluded that the Navy should examine these program support areas to ensure that they do not affect efforts to improve the SQMD program. The GAO further concluded that the Navy may also want to consider using some civilians in the program and implementing a Navy manpower career field as potential ways to alleviate some of the training and experience shortcomings. (p. 3, pp. 41-48/GAO Draft Report)

Now on p. 3 and pp. 30 to 35.

DOD RESPONSE: Partially Concur. The DOD concurs that the number of personnel assigned to the SQMD program, personnel turnover and experience, and the quality of training have contributed to the lack of full program documentation noted by the GAO. As part of a recent staff restructure, the SQMD program has been alloted a number of civilian positions in order to provide increased staff continuity and manpower related experience. Most authorized military billets are now filled, and a formal NAVMEC training course for SQMD analysts commenced in January 1986. The DOD does not concur, however, that a lack of travel funds has prevented gathering data from representative squadrons. Travel funding is sufficient for the tri-annual review of all squadron staffing standards and other factors. Additionally, the DOD does not concur in a military manpower career field for Navy. The Navy will continue to use its Officer Subspecialty and Navy Enlisted Classification systems to provide the NAVMEC with the majority of its manpower management personnel. The Navy's Civilian Career Program in Manpower Management established by SECNAVINST 12400.3 and OPNAVINST 12400.2 is planned to provide civilian professionals in this field to support such manpower planning efforts as the SQMD program.

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RECOMMENDATIONS

Now on p. 35.

- RECOMMENDATION 1(A): The GAO recommended the Secretary of the Navy direct that: Efficiency reviews be performed before developing or updating staffing standards. (P. 49, GAO Draft Report)

  DOD POSITION: Concur. The DOD concurs that all functions under study for standards development should be reviewed for potential efficiencies as an integral part of the development process. Work, which is nonessential, duplicative, or otherwise inefficient, is now deleted or modified as part of the standards development process. Expanded guidance in this regard will be incorporated in the NAVMEC SQMD Procedures Manual scheduled for reissue in July 1987.

Now on p. 35.

- RECOMMENDATION 1(B): The GAO recommended the Secretary of the Navy direct that: Staffing standards be developed for as many position requirements as practical, both officer and enlisted. (P. 49, GAO Draft Report).

  DOD POSITION: Concur. The DOD concurs that staffing standards should be developed for as many positions as feasible. The CNO has tasked the NAVMEC to develop a ground officer staffing standard, the draft of which is expected to be available for fleet and CNO review by February 1987, and for completion and approval by October 1987. A plan of action to complete staffing standards for all applicable officer and enlisted positions will be approved by the CNO by the end of FY 87 and will provide for completion of all standards by the end of FY 89.

Now on p. 35.

- RECOMMENDATION 1(C): The GAO recommended the Secretary of the Navy direct that: Staffing guidelines be developed for those officer and enlisted positions where staffing standards are seen as impractical (such guidelines should include the process for establishing positions, documenting their justification, and periodically reevaluating the need for them) (P. 49, GAO Draft Report).

  DOD POSITION: Concur. The DOD concurs that all such positions should be covered by documented guidelines delineating the process used to establish the position and its justification. In December 1986, the CNO directed the NAVMEC to identify all such positions and to complete documentation of the guidelines by the end of FY 87.

- RECOMMENDATION 1(D): The GAO recommended the Secretary of the Navy direct that: The SQMD staffings application process be improved to ensure the accuracy of maintenance work load by actions such as:

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- Using acceptable work measurement techniques to establish anticipated time for performing aircraft planned maintenance tasks, and

- requiring an independent, periodic review of maintenance documentation, at the squadron level (such review should include validation of historical maintenance data by analyzing other materials related to work load such as parts inventory records);

DOD POSITION: Partially Concur. The DOD concurs that a rigorous, periodic review of squadron historical maintenance documentation is appropriate. Emphasis on this aspect of manpower requirements development will be included in the NAVMEC SQMD Procedures Manual scheduled for reissue in July 1987. As noted in the DOD response to Finding D, the procedures for the regression analysis of Corrective Maintenance data will also be standardized and refined in the updated SQMD Procedures Manual. The DOD does not concur, however, workload measurement techniques should be applied to PM tasks that are already developed by the Naval Air Systems Command under Military Specification MIL-P-24534A to the level of documentation required by that standard.

Now on p. 36.

o RECOMMENDATION 1(E): The GAO recommended that the Secretary of the Navy direct that: Studies be conducted to determine the appropriate time allowances to be added to measured work load. (P. 49, GAO Draft Report)

DOD POSITION: Concur. As noted in the response to Finding E and Recommendation 1(G), Production Delay (PD) allowance will be deleted by the end of FY 87 from application to any measured workload unless an engineered study validating it is available, and other adjustments in time allowance application are being made. The Make Ready/Put Away (MRPA) and Productivity Allowance (PA) will continue to be applied as at present, except the NAVMEC will undertake additional studies to document fully the correct level of such allowances. These studies will be conducted subject to available resources and are expected to be completed by the end of FY 89.

o RECOMMENDATION 1(F): The GAO recommended that the Secretary of the Navy direct that: Staffing standards and guidelines, work load allowances and workweek time factors be validated periodically in accordance with DOD guidance.

DOD POSITION: Concur. The CNO has directed the NAVMEC to incorporate a tri-annual review of all standards, guidelines, and allowances in the SQMD Procedures Manual scheduled for reissue in July 1987. The DCNO (MPT) will continue to review

workweek time factors in conjunction with annual reviews of OPNAVINST 1000.16F (Manual of Navy Total Force Manpower Policies and Procedures).

- RECOMMENDATION 1(G): The GAO recommended the Secretary of the Navy direct that: The SQMD computer model be revised

  - To allow squadron indirect maintenance work load (administrative support, facilities maintenance, and utility tasking) to be allocated at least on a department-wide basis where feasible, and

  - to eliminate the compounding effect of work load allowances. (P. 49/GAO Draft Report)

Now on p. 36.

DOD POSITION: Partially Concur. The DOD concurs that Utility Tasking (UT) and Facilities Maintenance (FM) workload should be allocated on a department-wide basis. The CNO has directed the NAVMEC to modify the SQMD computer model to incorporate this provision by the end of FY 87. The DOD does not concur, however, that Administrative Support (AS) workload is feasible to be allocated above the workcenter level, as this workload is largely that of workcenter personnel management and leadership, which cannot be appropriately spread to other entities. In regard to the compounding effect of workload allowances, the DOD concurs that the application of Productivity Allowance (PA) to Preventative Maintenance (PM) is incorrect, and the application of this allowance to PM was eliminated in March 1986. Further, the DOD concurs that the Production Delay (PD) allowance is not properly documented as to need or degree, and in January 1987 the CNO directed the NAVMEC to delete the PD allowance from all SQMD calculations by the end of FY 87, unless an engineered study was available to validate the need for it. The continued application of the Make Ready/Put Away (MRPA) allowance to PM, and Productivity Allowance (PA) to AS workload will be continued as at present, pending time allowance studies expected to be completed by end FY 89.

- RECOMMENDATION 2: The GAO recommended the Secretary of the Navy require that current, accurate, and complete documentation be maintained to support: (A) methodology for establishing requirements; (B) staffing standards, workload allowances, workweek time factors; (C) squadron workload data used in calculating manpower requirements; and (D) the assumptions of the SQMD computer model. (P. 49-50, GAO Draft Report)

Now on p. 36.

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