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

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AIR FORCE MANPOWER PROGRAM

Improvements Needed in Procedures and Controls

GAO/NSIAD-87-137

GAO

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International Affairs Division

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

Dear Mr. Chairman:

You asked us to determine the degree to which the services' manpower requirements are based on sound and rigorous processes. This report is the last one examining a particular service and discusses our findings with regard to the Air Force Management Engineering Program.

The Air Force has had a manpower program since 1959. The program is based upon sound principles and incorporates many of the key elements of effective manpower systems. However, we found a number of areas where improvements in procedures and controls are needed. In particular, we found that work load measurement errors and inaccuracies in recording the results of staffing standards applications caused manpower requirements to be overstated. We are recommending that the Air Force take steps to improve its manpower program by providing additional guidance, management controls, and monitoring.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 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 Air Force; and the Director, Office of Management and Budget. Copies will also be made available to other interested parties upon request.

Sincerely yours,

Frank C. Conahan

Frank C. Conahan
Assistant Comptroller General

Executive Summary

Purpose

Personnel costs represent more than 40 percent of the Department of Defense's approximately $300-billion budget. In light of the significance of these costs, the Chairman, House Committee on Armed Services, asked GAO to provide information that would help the Committee judge the reasonableness of Defense manpower requests.

As part of GAO's work to address the Chairman's request, this report examines the effectiveness of the Air Force's process for determining manpower needs—i.e., whether it employs the necessary procedures and controls to accurately identify the number of personnel needed. GAO did not review the technical accuracy of the standards used to generate manpower requirements.

Background

In fiscal year 1987, Air Force personnel costs will reach almost $32 billion. The requirements for these personnel were determined by the Air Force's Management Engineering Program. The objective of this program is to incorporate accepted industrial engineering techniques and basic assumptions about Air Force operations to develop standards that reflect the amount of time needed to perform certain tasks and that can be applied to various combinations of tasks, or work loads, to estimate staff needs. The program then uses these numerical requirements to determine the necessary grades, occupations, and skill levels.

Results in Brief

GAO supports the Air Force's efforts to establish reliable manpower requirements and believes that the Management Engineering Program provides the basic foundation to accomplish this goal. The program is based on sound principles and contains many of the basic elements necessary for an effective manpower system. Weaknesses in some operational procedures and inadequate controls over the application of standards and recording of results, however, hinder production of accurate and reliable manpower requirements.

The degree of inaccuracy of Air Force requirements and the impact of this inaccuracy on operations and budgets are hard to determine precisely. However, GAO's review indicates that some requirements are underestimated and others overestimated. GAO's projections indicate that, out of a sample population of 170,800 positions, about 5,900 positions were overstated, over half of which were actually funded at an annual cost of over $100 million.

Principal Findings

Standards Coverage Less Than Reported

The procedures and controls by which the program operates are weak in certain areas. The program's data base on the current status of positions—i.e., whether they are justified by manpower standards—is not routinely updated or checked for accuracy. Based on a statistical sample, GAO estimates that the percentage of positions determined by standards is about 52 percent rather than the 67 percent the Air Force reported. (See ch. 2.)

Application and Recording of Standards Faulty

The application and recording of manpower standards has been faulty in several areas, resulting in inaccurate manpower requirements and unreliable data. Errors in collecting and using work load measurements have led to misstated requirements; GAO estimates that 2,752 positions were overstated and funded at an estimated annual cost of about $88.2 million. Errors in recording the results of standards application have had similar results, overstating 379 positions funded at a cost of $12.1 million. Imprecise or incomplete guidance for standards application has caused many of these errors; others are due to insufficient monitoring of the application processes. (See ch. 3.)

Recommendations

GAO makes recommendations to the Secretary of the Air Force to improve the manpower program by developing a means of ensuring the accuracy and currency of staffing standards and manpower data bases, basing staffing standards on the most efficient methods of performing work, clarifying manpower program guidance, and strengthening management controls and monitoring.

Agency Comments and GAO Evaluation

DOD concurred with most of GAO's findings and outlined Air Force corrective actions that had either already been taken or were being planned, including (1) developing internal controls at command level to ensure that standards are accurately applied; (2) preparing standardized guidance for applying standards; and (3) providing better training for technicians applying standards.

DOD also agreed that errors in work load measurement and recording caused requirements to be overstated and outlined Air Force actions to address these problems.

While DOD generally agreed with most of GAO's report, DOD was concerned that recipients of the report might conclude that elimination of overstatements in funded positions would automatically translate into reduced Air Force end strength. DOD noted that since Air Force funded manpower is considerably less than requirements, the overstatements GAO identified are an indication of misallocated manpower rather than excess manpower. While GAO agrees that a one-to-one correlation between reduced requirements and end strength should not be assumed, reducing requirements could lead to lower budget requests and end strength since the services' overall statements of requirements influence DOD and congressional decision-makers.

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Abbreviations

AFAA	Air Force Audit Agency
AFMEA	Air Force Management Engineering Agency
AFR	Air Force Regulation
CMET	Command Management Engineering Team
DOD	Department of Defense
FMET	Functional Management Engineering Team
FPCD	Federal Personnel and Compensation Division
MEP	Management Engineering Program
MSI	Manpower Standard Implementation

Introduction

Personnel costs comprise over 40 percent of the nation's approximate $300-billion defense budget. The Air Force alone requested $32 billion in fiscal year 1987 to fund over 870,000 active military and civilian personnel. Maintaining essential personnel is the key to a strong national defense as more modern and sophisticated weapons systems enter the military inventory. The Air Force therefore needs an accurate and reliable system for managing available manpower and for determining its manpower requirements.

A congressionally encouraged and endorsed means of providing this assurance is the development of an accurate and reliable manpower planning system. Through use of accepted industrial engineering techniques, such systems can provide managers with sound data to manage available personnel efficiently and effectively and prepare credible and defensible personnel budgets.

The Air Force Manpower Program

The Air Force has had a formal and comprehensive manpower-determination program since 1959. According to Air Force officials, the Air Force manpower program, called the Management Engineering Program (MEP), uses a variety of generally accepted industrial engineering techniques (such as work sampling and operational audit) to develop staffing standards and document manpower needs. Through the development and annual application of staffing standards and guides, the objective of the program is to identify the numbers, grades, occupations, and skill levels of manpower requirements. In the DOD Manpower Requirements Report: Fiscal Year 1987, the Air Force reported that staffing standards covered approximately 67 percent of its authorized positions.

A staffing standard is a work measurement technique that identifies the number of workers needed to accomplish a given amount of work. The standards are derived using mathematical equations with variable factors for incorporating actual work load data. Based on the work load quantity entered into the equations, the total manpower requirements are computed. For example, the staffing standard for a pharmacy uses the average number of prescriptions filled per month and the average number of days of bed occupancy per month to determine the manpower required. (See app. I for a detailed example.)

In addition to staffing standards, the MEP uses several other techniques, such as computer simulation, maintenance man-hours per flying hour,

maintenance job standards, procurement and logistics manpower models, and guides. Guides are estimates of manpower allowed and are generally not based upon measured work load. Manpower justified by guides is supported by surveys, evaluations of planning and programming data, staff and contractor estimates, and other similar data sources. A guide is suitable when (1) lack of experience with new systems makes development of a standard of infeasible, (2) standards would be short-lived because a system is approaching phase-out, or (3) sufficient time or resources are not available to develop and approve a standard.

Since 1981, the MEP has devoted major effort to a type of review previously called "methods improvement" or "productivity enhancement studies" and now called "functional reviews" in the Air Force and "efficiency reviews" in the Department of Defense (DOD). This type of review involves examinations of actual work processes and work flows to identify work or methods that may be nonessential, duplicative, or otherwise inefficient. DOD requires the military services to perform efficiency reviews in all functions where contract cost comparisons are not required.[1]

Organizationally, the Director of Manpower and Organization, Air Force headquarters, develops and administers overall program policy and guidance. Technical guidance and approval for overall standards development and maintenance is provided by the Air Force Management Engineering Agency (AFMEA), located at Randolph Air Force Base, Texas, with various Functional Management Engineering Teams (FMETS) located throughout the United States. Major Air Force commands and other Air Force entities called "separate operating agencies" and "direct reporting units" are responsible for program implementation and effective manpower management. Technicians from Command Management Engineering Teams (CMETS) located at various Air Force bases are responsible for developing and applying standards and report to the major command.

Objective, Scope, And Methodology

We reviewed the Air Force MEP to assess the managerial procedures, practices, and controls incorporated in the program and the accuracy and currency of standards applications and reporting. We did not assess the technical accuracy of the standards.

[1]Air Force functions include such things as medical, transportation, accounting and finance, and civil engineering. Office of Management and Budget Circular A-76 requires cost-comparison studies of commercial functions for contracting purposes.

We visited 25 Air Force activities responsible for developing, implementing, and maintaining the MEP. These activities included Air Force headquarters, AFMEA, and 2 functional management engineering teams, 7 Air Force commands, and 14 base-level CMETs. (See app. II.)

At commands and bases, we interviewed key officials regarding manpower management procedures and practices and reviewed related regulations, instructions, correspondence, mission statements, and organization structures. We gathered documentation on how the various units were implementing their responsibilities.

We validated the application of 170 statistically selected standards by reviewing application procedures and the accuracy of work load data. Details concerning the statistical methodology we used are discussed in appendix III. To validate the application of a standard, we (1) interviewed manpower technicians who applied the standards, (2) discussed application procedures with officials of various work centers, (3) reviewed standard development files and standard application results and compared them with the manpower requirements recorded on manpower documents, (4) determined whether the positions had actually been funded, and (5) applied standards, using directions specified in the standard and the data applicable at the time of the actual application.

We used statistical sampling to evaluate the application and use of staffing standards. We selected the seven commands with the largest number of positions reported by the Air Force as being covered by standards. These seven commands accounted for 361,734 (70 percent) of the total Air Force positions reported to be covered by standards. We randomly selected two bases under each command. Sampling was designed to project findings at the 95-percent confidence level with determinable confidence intervals. The population eventually had to be adjusted downward to 170,794 (33 percent of the total population) because of errors we found in the system and exclusions that were made to maintain the integrity of the sample. The methodology we used allowed us to project separate results for funded and unfunded requirements. (See app. IV for the population estimates, sampling errors, and upper and lower confidence limits).

We reviewed our methodology with Air Force statisticians at the start of our audit work, and they agreed that it was statistically sound. However, in their comments on a draft of this report, DOD officials objected to any statistical projection of our findings on the basis that we had not

used statistically valid methods. We discussed our methodology further with DOD and Air Force officials, and we continue to believe that our methodology is statistically valid for the projections that we make.

DOD provided oral comments on a draft of this report which were incorporated as appropriate. Formal written comments received after we had incorporated DOD's oral comments are the subject of a separate communication with DOD.

We conducted our review from February 1985 through November 1986 in accordance with generally accepted government auditing standards.

Improvements Needed in Reporting Standards Coverage, Reviewing Standards for Currency, and Using Efficiency Reviews

The Air Force MEP framework is based on sound principles and incorporates several key elements of effective manpower systems. However, we found several weaknesses that threaten the integrity of program operations and the accuracy of manpower requirements.

First, we estimate that about 22 percent fewer positions are under standards than the Air Force has reported because of data base coding errors. Second, numerous manpower standards and guides may be out of date, and most guides are not reviewed for currency. Third, standards generally did not incorporate the results of methods improvement studies. These weaknesses affect both the reliability of the Air Force manpower program and the accuracy of the data for DOD, the Office of Management and Budget, and congressional decision-makers.

During the course of our review, the Air Force recognized the need to correct and clarify some operational procedures and took action to make changes.

Elements of Effective Manpower System in MEP

The Air Force, having had a manpower program since 1959, has generally been looked upon as the lead service in determining and using workforce staffing standards. The MEP contains many of the key elements of an effective manpower system.[2] These elements include

- a well-defined manpower organizational structure and respective responsibilities;
- a manpower career field providing qualified personnel (over 2,800 positions funded at the time of our review) to develop, review, apply, and update standards;
- detailed procedures and processes for developing, issuing, and updating work center standards and summary level equations that are clearly defined and documented;
- standards that specify the required skill and grade levels and occupational specialties;
- data sources for applying staffing standards that are clearly identified and defined and that are consistent throughout the service;

[2]A number of previous GAO studies have identified and discussed the attributes of effective systems: Navy Manpower Management: Continuing Problems Impair the Credibility of Shore Establishment Requirements (GAO/NSIAD-85-43, March 7, 1985); Federal Workforce Planning: Time for Renewed Emphasis (GAO/FPCD-81-4, Dec. 30, 1980); Handbook for Government Work Force Requirements (GAO/FPCD-80-36, Jan. 28, 1980); and Development and Use of Military Services' Staffing Standards: More Direction, Emphasis, and Consistency Needed (GAO/FPCD-77-72, Oct. 18, 1977).

- the use of staffing standards in managing a command's workforce and responding to changes in force levels; and
- the incorporation of a number of management controls into the program.

Nonetheless, weaknesses exist in certain key areas of the program.

Standards Coverage Less Than Reported

The Air Force has consistently reported that staffing standards cover about 67 percent of its positions. We found, however, that manpower data bases erroneously identified many positions to be under standards when in reality the standards did not exist or were no longer applicable. Inaccurate coding was evident at all commands and at 12 of the 14 bases we visited. Based on our sample results, we estimate that Air Force staffing standards cover only about 52 percent of Air Force positions.

We discovered the miscoding as we were validating the accuracy of the work load data used in staffing standards to determine manpower requirements. We expected our sample of standards to allow us to project our findings to 361,734 (70 percent) of the Air Force positions reportedly covered by standards. However, to maintain the integrity of our sampling methodology, we had to substitute many standards for a variety of reasons. (See app. V.) As a result, we were able to project our findings to only 170,794 (33 percent) of standards-covered positions—a reduction of 190,940 (53 percent).

We had to substitute many standards because they were not applicable at bases, they were not manpower standards, or they had been rescinded or waived. In addition, many requirements in several commands were miscoded as being based on standards when they should have been coded as being based on guides. Guides miscoded as standards required us to make 86 substitutions. Our sampling methodology allowed us to project that at least 54,591 positions were miscoded as standards when they should have been coded as being based on guides. For example, some manpower requirements based on the maintenance man-hour per flying hour technique in the Strategic Air Command and in the Military Airlift Command were miscoded as standards when the requirements were actually determined by a less rigorous method. An Air Force official estimated that about 7,500 requirements in the Air Force Systems Command determined through the use of manpower models were similarly miscoded.

Miscoding errors occurred because neither commands nor CMETs were periodically reviewing the Manpower Standard Implementation (MSI)

codes, which designate the basis (such as staffing standard or guide) for a position.

During our review, the Air Force directed commands to review MSI codes for accuracy. Air Force Logistics Command officials told us that they had changed the coding of about 20,000 requirements from standards to guides and that they were reviewing other requirements for accuracy.

Standards and Guides Not Reviewed for Currency

We found that several standards were in need of updating. Furthermore, a mid-1984 Air Force decision to postpone the 3-year review cycle may perpetuate the use of outdated standards. Manpower guides also were not being reviewed as required.

Currency of Standards Not Reviewed

Until August 1984, Air Force regulations required standards to be reviewed for currency at least every 3 years. In August 1984, the Air Force discontinued this requirement while functional reviews were being conducted to avoid reviewing standards that would shortly be replaced. The Air Force plans to resume reviewing the currency of standards when it completes the first generation of functional reviews. In the interim, however, the Air Force may be using standards that no longer represent accurate manpower requirements.

Our review of standards published for Air Force-wide application or application in six commands disclosed that 61 percent of the standards were dated 1982 or earlier. This statistic, coupled with the completion timetable for functional reviews, raises concern about currency of standards used to determine and justify manpower requirements. The passage of time also increases the likelihood that source documents, such as reports or forms used to provide information on work load variables, may be discontinued or replaced. For one standard we validated, for example, the work center no longer used the source documents providing information for 9 of 15 variables, but the standard did not reflect this change. For another standard, the Air Force had replaced the source document but had not issued instructions to use the new one. The Air Force later rescinded the former standard and has recommended that the latter standard be rescinded.

Before functional reviews, FMETs and commands were required to review standards for currency at least every 3 years. In reviewing standards, the FMETs or commands were to first verify that nothing had changed in

the work center that would affect the standard. Next, the FMET or command, in conjunction with work center managers, was to analyze the currency and accuracy of (1) work center descriptions, (2) statement of conditions, (3) definitions and sources of work load factors, (4) manpower tables, (5) the standard's limits, (6) applicability statement and instruction, and (7) supplements to the standards.

In our validation of standards the Air Force had applied, we found that a number of standards had not been reviewed for currency within the 3-year period. Using the dates of the last posted changes in the standards publications, we found that 65 of our sample standards (38 percent) had not been reviewed or changed within the 3 years before the currency review requirement was discontinued.

A mid-1984 Air Force Inspector General report raised similar questions about the currency of some standards used to determine requirements and reported that many standards were old and scheduled for functional review. Further, the report noted that the time required to develop standards adversely affected their currency. In one function, operational managers complained that new standards were often outdated and required change by the time they were implemented because of the lengthy development process.

Manpower and work center officials complained of the difficulties arising from having to apply outdated standards. For example, one standard we examined was published in 1978, was determined by the Air Force to be outdated in 1979, and had not been reviewed for currency since publication. Yet, the standard was applied using data the work center provided because the work load data could no longer be retrieved from the source document described in the standard. In fact, the computerized source documents had been replaced twice, but the CMET did not report problems with this source. We found several dated standards for which source documents were no longer available.

The obsolescence of some standards resulted from base CMETs not recording problems identified during application or communicating these problems to Air Force FMETs. CMET technicians at several bases did not record such application problems, such as the need to use an alternative source to collect work load data because the standard prescribed source was unavailable, or the data was no longer available as described by the standard. Thus, commands and Air Force FMETs had no indication that standards were dated. During our review, the Air Force initiated action to identify those standards still current. Commands were later

informed about those standards that should be applied, those for which functional reviews were imminent, and those that should not be applied.

Guides Not Reviewed for Currency

Air Force Regulation (AFR) 26-1 requires manpower guides to be reviewed annually to determine if they are still current. However, these guides have not been systematically reviewed, making requirements based on them questionable. In addition, some commands interpreted this regulation to apply only to published guides and not to unpublished ones.

As of March 1985, according to Air Force officials, guides supported 269,661 funded positions (34 percent of requirements). The miscodings we found would indicate that this percentage was actually higher. Air Force headquarters depends on commands to review the continued validity of guides and to reflect the results of updating in certification reports. A headquarters official acknowledged that guides were sometimes difficult to validate and that headquarters was more concerned about standards since they covered most funded positions. However, since over 34 percent of the requirements are justified on this basis, we believe that guides should be periodically reviewed as Air Force regulations require.

Methods Improvement Studies Not Incorporated Into Standards

DOD instruction 5010.37 requires that staffing standards incorporate the results of methods improvement studies. If they do not, standards may be based on inefficient work methods, and the use of these standards may produce inaccurate requirements. We could find no evidence that methods improvement studies were routinely incorporated into standards in the past and found indications that functional review results may not be fully incorporated into standards now.

Standards Developed Before Functional Reviews

The Air Force's process for developing standards called for methods improvement or productivity enhancement studies to be conducted before standards were developed. However, manpower officials from all levels told us that standards developed before the functional review program began did not, for the most part, incorporate such studies. Instead, standards were usually developed based on the way the work center was operating at the time of measurement. Consequently, existing standards may contain work center inefficiencies and may not reflect the minimum manpower required to perform the function. Some officials said that improvements identified by these productivity

enhancement studies were considered but not incorporated in the standards to any great extent. We found little evidence that such studies were actually performed.

Air Force officials told us that, in the past, emphasis was on achieving more widespread standards coverage. Performing methods improvement studies would have slowed progress in extending standards coverage. Other officials said that these studies were not performed because improvements had to be acceptable to functional managers, who had little incentive to become more efficient if it meant reduced manpower requirements. Further, the manpower organization had no authority to implement efficiencies identified.

Functional Review Standards

Since the early 1980s, the Air Force has been working toward implementing a DOD directive aimed at incorporating productivity-enhancing, cost-cutting measures into its day-to-day operations. The intent of the DOD efficiency review program is to identify and eliminate nonessential work and incorporate results or enhancements into staffing standards.

The Air Force's functional review program has achieved some success. As of September 30, 1986, about 100 reviews addressing a total of over 78,000 position requirements had been approved and were in various stages of implementation across the Air Force. The estimated impact on authorizations amounted to 1,674 positions, for a 2.1-percent savings. An additional 379 studies addressing 244,205 position requirements were in process, and 467 studies addressing 237,222 position requirements were planned. We did not specifically audit the technical details of the process for developing standards or making functional reviews. However, during the course of our work in validating the application and updating of standards, we were able to make a number of observations that, coupled with concerns expressed by manpower officials, surfaced potential problems.

For example, procedures appear inadequate to provide for independent review of the validity of work improvements. Therefore, the success of the program depends on the cooperation of functional managers, who are responsible for accomplishing Air Force missions, to identify and implement enhancements as well as to accept and implement performance work statements. Not surprisingly, these managers have sometimes resisted reductions in resources. On numerous occasions, we were told or we observed in documentation that functional managers resist using the results of functional reviews that could potentially yield significant

manpower savings. While we are not concluding that the functional managers did not have valid objections, we are concerned that functional managers alone decide whether proposed efficiencies will be implemented.

In addition, although the functional review program has reported a number of successes, progress has been slow. Completion of scheduled reviews around 1990 is unlikely, increasing the probability that existing standards used to justify requirements will become dated.

Conclusions

The Air Force has been committed to determining its manpower needs using work measurement techniques since 1959. The Air Force manpower engineering program is generally based on industrial engineering principles and contains several key elements of effective manpower systems. However, the program does have some weaknesses. Specifically, inadequate monitoring of command manpower documents has resulted in requirements being miscoded in the manpower data base and incorrectly reported as being justified by standards. These inaccuracies reduce the usefulness of these manpower documents as managerial and budgetary tools.

The Air Force decision to postpone reviews of the currency of standards raises some concerns. Although the strategy to defer updating standards pending completion of functional review studies may have been warranted at the outset of the efficiency review initiative, we believe that delays in that program will result in even more standards becoming out of date. Consequently, manpower requirements may be misleading and managerial decisions regarding manpower resources may be adversely affected. The absence of review of those manpower requirements justified by guides may also affect the accuracy of requirements.

Reported Air Force manpower requirements may be overstated because existing standards were generally not based on methods improvement studies. While the Air Force functional review program provides a more structured approach to incorporating efficient operations into standards, we are concerned that the program may not fully incorporate the efficiencies identified because of functional manager resistance.

Recommendations

We recommend that the Secretary of the Air Force strengthen the operational procedures and management controls in the standards development process used in the MEP by

- establishing specific procedures for documenting the review and update of standards and monitoring compliance;
- improving the accuracy of the staffing standards coding system to identify the type of standard or other method of determining manpower needs on which a given requirement is based;
- developing a way to ensure that the currency of staffing standards is reasonably maintained during the transition to the functional review approach to developing standards;
- enforcing the requirement that staffing guides be reviewed for currency and establishing monitoring procedures to ensure compliance; and
- ensuring that efficiencies identified through the functional review process receive an independent review.

Agency Comments and Our Evaluation

In its comments on a draft of this report, DOD stated that the Air Force has already initiated action on many of the problems based on preliminary information we provided.

DOD agreed that fewer Air Force positions were covered by staffing standards than the 67 percent that had been reported in the past. DOD noted that the fiscal year 1988 Defense Manpower Requirements Report cites 63-percent coverage and that current Air Force data files reflect approximately 57-percent coverage. The Air Force has taken action to reduce the potential for coding errors and has directed commands to develop internal controls to ensure accuracy in the application of standards and standards coverage codes.

DOD agreed that some standards were dated during the time of our review and noted that the Air Force had instituted annual reviews of standards to ensure currency. DOD stated that AFMEA's suspension of the 3-year review for standards undergoing functional review did not eliminate the annual requirement for applying standards and checking that they are still applicable. DOD stated that as long as standards pass the annual currency review, they are reasonable indicators of manpower requirements. We agree that checking standards for currency when they are reapplied would be sufficient and would satisfy the intent of our recommendation.

DOD agreed that guides, particularly unpublished guides, were not being reviewed for currency as Air Force policy requires. The Air Force has directed commands to develop internal controls to ensure that all guides are reviewed annually.

DOD stated that, although it encouraged the incorporation of methods improvement studies into standards development before the functional review program, this was not always done. DOD stated that methods improvement studies were incorporated into many standards, but did not provide any specific examples. We found no evidence that methods improvement study results were actually incorporated into any of the standards we examined.

DOD stated that methods improvements are being incorporated into standards developed under the functional review program and, in order to further improve the process, the Air Force is using the Suggestion Program and Model Installation Program to solicit ideas for the most efficient organization structure. DOD did not agree that functional managers control the review process. However, DOD noted that, in November 1986, interim guidance on functional reviews was provided which raised the approval authority on issues of level of service and methods improvement to more senior levels.

DOD concurred with all our recommendations and cited Air Force actions to address them. Commands are developing additional internal controls, and the Air Force has initiated periodic staff assistance visits to oversee compliance.

Improvements Needed in Application and Recording of Standards

The MEP has not implemented adequate controls to ensure that staffing standards are accurately applied and recorded on manpower documents. Based on the frequency of application and recording errors we found, we estimate that Air Force reported manpower requirements were misstated by 7,089 positions. Of this number, 5,940 positions were overstated, and over one half of the overstated positions had been authorized (funded) at an annual salary cost of over $100 million. Since our sample was aimed only at projecting our findings to a little over two thirds of the Air Force positions believed to be covered by staffing standards, the number of misstated requirements and associated salary cost may be even greater.

Control problems we found included inadequate guidance on how to apply standards (particularly with respect to collection and verification of work load), limited training in the application of standards, and insufficient monitoring of application results. Since these weaknesses can lead to inaccuracies in manpower requirements, they undermine the reliability of the program.

Requirements Overstated Due to Errors in Standards Applications

Most of the inaccurate manpower requirements we found were the result of errors that manpower technicians made in measuring work load during the standards application process. Based on our validation of 170 standards applications, we estimate that inaccuracies in the measurement of work load have caused Air Force manpower requirements to be overstated by a net total of 4,339 positions (about 2.5 percent of the adjusted population of 170,794). We estimate that 2,752 of these positions were funded at an annual salary cost of about $88.2 million. (See table 3.1.)

Table 3.1: Estimates of Misstated Positions Caused by Work Load Errors

Dollars in millions

Category	Total positions	Funded positions	Salary cost[a]
Overstated	4,548	2,765	$88.6
Understated	172	14	.4
Net overstated[b]	4,339	2,752	88.2
Total misstated	**4,720**		

[a]Salary cost was determined by multiplying the projected number of overstated funded positions by $32,047, the average position cost from the FY 1987 DOD Manpower Requirements Report.

[b]Overstated and understated positions do not equal the net overstated positions due to estimating methodology and rounding.

The 170 randomly selected manpower standards included 370 work load values. We found errors in 137 (37 percent) of these values and in 91 (54 percent) of the standards applied. In 16 of the 170 standards, the likelihood of error was minimized because work load was not the determining factor. That is, manpower levels for these areas were determined by directed or constant manning if a particular function existed or was organized in a certain way.

A 1985 Air Force Audit Agency (AFAA) report found similar problems with the accuracy of work load data. AFAA judgmentally sampled 105 work centers (covered by 30 standards) in two major commands—the Military Airlift Command and the Tactical Air Command. It found manpower requirements misstated at 51 of the 105 work centers. As a result, staffing requirements were overstated by 128 positions (94 of which were funded) and understated by 28 positions. The net 100 overstated positions represented a 6.3-percent overstatement. AFAA computed the annual salary cost of the 94 funded overstated positions to be $1.7 million.

Causes of Errors

In order of frequency, the errors were caused by technicians' (1) accepting work load data that work centers provided without independently verifying it, (2) using inaccurate work load values, (3) not complying with staffing standard directions regarding work load collection, and (4) making arithmetic errors in the application process. Some of the applications we reviewed had multiple errors resulting from more than one of these reasons. Table 3.2 shows the frequency of and reasons for errors in both work load values and standards.

Table 3.2: Frequency and Reasons for Work Load Errors

Reason for error	Number of Work load value errors	Number of Standards affected
Technicians accepted incorrect work load data from work centers without verification	56	30
Technicians used inaccurate work load:		
Did not include all work load required	8	8
Miscounted work load volume	7	7
Recorded work load incorrectly	4	4
Used incorrect results of subordinate standards	5	5
Misinterpreted the work load to be counted	2	1
Did not use prescribed time period	1	1
Estimated work load incorrectly	1	1
Did not retain documentation to explain inaccuracies	12	10
Total	**40**	**37**
Technicians did not follow staffing standard directions:		
Did not use defined work load source documents	18	11
Were not diligent in reading and following standard directions	10	9
Did not interpret standard definitions correctly	1	1
Total	**29**	**21**
Technicians made arithmetic errors.	12	11
Total	**137**	**99[a]**

[a]Work load value errors were found in 82 standards, but some had errors for more than one reason.

Some standards are more sensitive to fluctuations in work load values than others. For instance, a 10.0-percent overstatement of work load in one standard we examined did not affect requirements, while a 0.3-percent overstatement of work load in another standard overstated requirements by one position. Many of the work load errors we found (74 of 137—54 percent) were not far enough off to have an effect on the accuracy of stated manpower requirements.

Technicians Accepted Incorrect Work Load Data From Work Centers Without Verification

Air Force regulations require commands to verify work load data used in applying standards. However, we found 56 erroneous work load values involving 30 standards at 12 bases because manpower technicians accepted incorrect data without verifying it. That is, they did not extract work load data from the prescribed source documents and did not spot check behind source document values to ensure accuracy. All commands visited had technicians who were not verifying the work load data. For example, at one location the technician accepted work load

values for a civil engineering standard provided by the work center instead of directly collecting the data from the prescribed source documents. Had he done so, the calculated manpower requirements would have been 20 rather than 35 positions.

Although many of the technicians we spoke with said that they considered the accuracy of work load data very important, confusion existed about who was responsible for that accuracy. Some technicians considered the accuracy of work load data to be the work centers' responsibility and, therefore, did not spot check it for accuracy.

Technicians Used Inaccurate Work Load

The second most common reason for errors in work load data was that technicians used inaccurate data. We found 40 errors of this type, involving 37 standards at 13 bases across all commands.

Examples of mistakes made in collecting data included technicians' not counting all work load required, miscounting work load volume, recording work load incorrectly, using incorrect results of subordinate standards, misinterpreting work load to be counted, not using prescribed time periods for counts, or estimating work load incorrectly. Further, errors existed in 12 instances where technicians did not retain documentation supporting their counts, preventing a determination of the reasons for the errors. Even though only a few of these inaccuracies actually caused requirements to be misstated, the frequency of the errors highlights the need for technicians to be more cautious while collecting work load data.

Technicians Did Not Follow Staffing Standard Directions

Manpower technicians made 29 work load errors involving 21 standards at 10 bases within six commands because they did not follow staffing standard directions. These errors occurred because technicians (1) did not use the prescribed source documents to obtain work load counts, (2) did not follow staffing standards directions diligently, or (3) had problems in understanding work load definitions. Considering the potential for varied interpretations, definitions of work load and instructions on what work load to count and where to obtain such counts should be as specific as possible.

Using an incorrect source can result in significant requirement errors. For example, the technician applying a refrigeration and air conditioning standard at one base overstated the work load because he used a different source from the one prescribed in the standard to obtain total

square feet of floor space. This was a major reason for the work center's requirements being overstated by three positions.

Sometimes complex standards and unclear work load definitions contributed to work load errors. In particular, some civil engineering standards were very complex, having a large number of work load factors. Technicians also reported some confusion about what factors they were supposed to use. For example, the Engineering-Technical and Design standard was particularly cumbersome and time-consuming to apply since it had 15 work load values. We verified this standard at two bases and found 15 requirements to be overstated at one base and 8 overstated at the other base. Of the 20 civil engineering standards applications we reviewed, 11 had work load errors.

Technicians Made Arithmetic Errors

Technicians made 12 arithmetic errors in the application of 11 standards at eight bases in five commands. They ranged from simple arithmetic mistakes, such as not adhering to rounding rules, to the use of incorrect factors to calculate application requirements.

Recording Inaccuracies Caused Overstatements in Manpower Requirements

Inaccurate recording of the results of standards applications also contributed to requirement misstatements. Although some applications we validated were accurate, we found that the requirements had not been recorded properly in the Air Force's manpower data base. Overstated requirements resulting from inaccurate recording amounted to 1,392 positions, of which 379 had been funded at a cost of over $12.1 million.

Manpower technicians are responsible for the accuracy of information contained in the manpower data base and recording the results of standards applications in this system. Manpower regulations require that the changes be recorded in the command manpower data system when the application of a standard results in a change in requirements. However, some commands had not recorded the results of standard applications or had recorded them inaccurately.

We estimate that the requirements the Air Force reported were misstated by 2,369 positions (1,392 overstated and 977 understated) because of errors in recording standards applications. These estimates were based on errors found in 16 applications at six bases in four commands. These inaccuracies occurred because the Air Force's manpower data base had not been updated to accurately reflect the standard application results.

Particularly common were misstatements of unfunded requirements. We found instances where requirements were inaccurately reported, and manpower technicians saw no need to correct the errors in accordance with applications results because the positions were not funded. These types of errors reduce the accuracy of the Air Force's total manpower requirements.

Inadequate Application Guidance and Monitoring Underlying Causes of Errors

Overall Air Force guidance regarding standards applications is inadequate, and specific Air Force procedures for routinely applying standards and ensuring quality results have not been incorporated into the MEP. Adequate guidance is necessary to (1) delineate organization procedures and responsibilities to promote basic procedural consistency throughout the organization and serve as a training tool for new staff, (2) identify staff responsibilities, and (3) contribute to operational continuity, particularly in environments where personnel turnover is frequent. The absence of adequate Air Force-wide procedures and periodic managerial monitoring impairs the program's reliability and effectiveness. As previously discussed, in applying standards, manpower technicians frequently relied on work load data provided by work centers, did not routinely verify or spot check correctness of the data, and did not make sure that source documents necessary for applications were available. Furthermore, technicians did not always retain documentation supporting applications or verification of work load data. These weaknesses perpetuate work load and data base inaccuracies, contributing to misstated manpower needs.

Little Air Force-Wide Guidance on the Standards Application Process

We believe that a major reason for the frequent mistakes made by manpower technicians is that the MEP has not incorporated formal procedures for standards applications and quality control. The application of standards is just as important as their development. However, while the Air Force provides guidance on standards development, it provides little guidance on standards applications. Some commands and bases have just recently begun to develop specific application procedures.

Guidance for the MEP is provided in AFR 26-1 and 25-5. AFR 26-1 contains Air Force manpower policies and procedures, and AFR 25-5 provides guidance on MEP policy, responsibilities, and requirements and on the techniques and procedures to be used in developing manpower standards and other engineering studies. This guidance, however, is heavily

oriented toward policy and the technical aspects of developing standards. It gives little emphasis to the process of routinely applying existing standards.

Both regulations address standards applications. Chapter 41, Volume II of AFR 25-5, "Application Procedures," provides guidance only for determining the initial impact of newly developed standards. No guidance is provided on later standard applications that are required annually.

Chapter 1, Volume III of AFR 26-1 discusses Air Force policy on the use of manpower standards and guides and establishes the requirement to apply existing standards annually. This guidance explicitly assigns commands responsibility for (1) certification of standards currency and use, (2) verification of work load data, (3) documentation of standards applications, and (4) currency of the manpower data base reflecting applications. However, the guidance on recurring or later standards applications is limited primarily to timetable and documentation requirements. The guidance is silent with respect to such crucial areas as (1) the descriptions of work centers; (2) collection, verification, and documentation of work load data; and (3) manpower document and data base accuracy. These areas are those in which most standards application errors have occurred.

Inconsistent Command Procedures for Applying Standards

Although Air Force commands are responsible for managing manpower, six of the seven commands we visited had only recently developed formal procedures for applying standards. Four commands had approved procedures dating between June 1984 and February 1986. Most procedures, however, were approved around mid- to late 1985 and early 1986. The procedures of two commands were in draft at the time of our visit, and one command had not developed formal standards application procedures.

According to Air Force manpower policy, overall guidance is structured to provide commanders flexibility in managing their respective manpower resources and to provide for prompt implementation of standards. Such flexibility has contributed to differing levels of specificity in the procedures to be followed for applying standards and ensuring the quality of results. The procedures of some commands are comprehensive and very explicit about what command- and base-level technicians are to do—which we believe would, if followed, produce sound and reliable results. Other command procedures are less comprehensive and explicit

about what tasks are to be done and who is responsible for accomplishing them.

We recognize that missions change and that commanders need some flexibility to effectively manage manpower in accordance with such changes. However, uniform and consistently applied procedures for standards application and quality control within and among commands would help ensure greater accuracy in computing manpower needs.

Development of comprehensive and consistent procedures will not improve the accuracy and reliability of manpower requirements or provide a better basis for making decisions unless they are used. In one command, which has comprehensive and explicit application procedures, we found that one of two base CMETs we visited was not even aware of the procedures. Although the other base CMET was aware of the procedures, it did not always comply with them. We found similar situations where procedures were not being followed at several other bases within other commands.

Base-level CMETs are relied on primarily to supply and verify the information needed to establish manpower requirements. Of the 14 base CMETs we visited, 6 had established formal procedural guidance on standards applications, and 2 had formalized quality control procedures. We found, however, that this guidance was not always followed and that actual practices varied among manpower technicians within commands and even within base-level CMETs.

Technician Practices Inconsistent

In validating the application of selected standards, we interviewed 47 manpower technicians to determine the steps they followed in applying standards. Their responses demonstrated significant procedural differences in technician preparation and application techniques, particularly with regard to verification and documentation.

In preparing to apply standards, for example, some technicians prepared more thoroughly than others by reviewing command taskings, standards to be applied, and prior-year applications. Application practices varied with respect to reviewing work center descriptions and currency of standards, collecting and verifying work load data, and documenting results. Some technicians said that they visit work centers to discuss work center descriptions. Other technicians said that they did not visit the work center and relied on functional managers to review the work center description.

We also found that technicians used a variety of techniques to collect work load data. Some technicians visited the work centers and personally collected data from standard prescribed sources. Others, however, did not visit work centers and used alternative sources for the data; allowed the work center to extract and provide the data; or used a combination of prescribed sources and nonprescribed sources. Further, base CMET and command officials told us that they interpret the Air Force regulation that requires technicians to collect data on work load as meaning that technicians can collect data by asking work centers to provide the data.

Some technicians thought that, to verify data, they had only to check whether the data actually came from the prescribed source. They did not verify the data reported in that source because they did not believe that verification was their responsibility. Also, some commands allowed work centers to submit data directly and did not task base technicians to verify the accuracy of counts. We believe that spot checking by physically collecting and verifying work load data is an important internal control and should be done in applying standards. However, even though verification of work load data has been a requirement, little verification was being practiced.

In February 1985, the Air Force reemphasized the need for verifying the work load data by requiring that 20 percent of work load values collected be checked for accuracy against their originating source. Verification is to include checking the accuracy of the work load definitions, sources, and counts. Most of the technicians we talked to, however, said that they did not perform these checks, and of the few who did 20-percent checks, most said that they did not document results.

In November 1985, Air Force Headquarters issued verification guidelines to all commands requiring them to identify all verifiable work load factors, randomly select a 20-percent sample for verification, and schedule more frequent verification for those factors where recurring inaccuracies are found. The guidance also suggests giving greater attention to those factors affecting manpower-intensive work centers. However, the guidance does not provide for consistent procedures among commands since it allows the commands to establish their own procedures for verifying work load. In addition, we found various interpretations of the 20-percent sample requirement.

Except for standards with only one verifiable work load factor, the new verification approach may identify only errors in the selected values.

Other work load values not selected in a standard may also be in error. Consequently, this verification approach may not identify the full impact all errors have on manpower requirements. Furthermore, the approach provides no reasonable assurance that all work load factors will be verified over time, or that standards and work load factors whose results are more sensitive to changes that affect manpower requirements will be identified. Modifying the guidelines to require verification of each work load value for the 20-percent sample of standards and to provide guidance on how to identify standards with a higher likelihood of error will strengthen the verification process and provide greater accuracy in manpower requirements.

Manpower personnel are supposed to maintain documentation regarding standards applications and implementation until the next application. However, we found that they did not always maintain supporting documentation for either standards application or work load verification.

Technicians Inadequately Trained

Even the most accurately developed standard employing the most rigorous industrial engineering techniques will not accurately identify the manpower needed to accomplish Air Force work unless properly applied. We believe that manpower technicians have received insufficient training to ensure that standards are properly applied. The types of technician application errors we found indicate a need to train both experienced and new technicians entering the manpower career field concerning the standards application process.

Currently, Air Force technicians receive limited formal training in standards application. Technicians enter the manpower specialty career field from other Air Force specialty areas and are trained at the Air Force manpower school at Kessler Air Force Base, Mississippi. The 10-week course of instruction provides training in such areas as organization and resources, statistics for manpower management, methods improvement, measurement procedures, measurement design and functional review, and standards development and manpower implementation and utilization. The plan of instruction being used at the time of our review devoted a total of 336 hours to these areas. This course, however, devoted only 2 hours to standards application. Moreover, these 2 hours focused on initial application of new standards and not later application of existing standards.

The Air Force trains its technicians to apply standards largely through on-the-job experience. We believe that such an approach may have contributed to the mistakes we found in the application of standards. Among the CMETs we visited, procedures for standards application varied from no formal written instructions to very specific written expectations. However, where written instructions existed, technicians did not always follow them. Furthermore, experienced as well as inexperienced technicians made mistakes—even though at the 14 bases we visited, 24 of 25 officers, all 76 airmen, and 39 of 84 civilians (46 percent) had completed the Kessler Course.

Monitoring of Operations Insufficient

The monitoring of standards use is essential to ensure effective program control and accountability, particularly where the management of manpower programs is decentralized. Air Force Headquarters needs to improve its monitoring of operations to ensure that standards are applied annually and requirements accurately determined.

We identified monitoring weaknesses at all levels. Specifically, reports certifying the use of standards submitted by most commands were inaccurate or were not monitored by Air Force Headquarters. Further, commands were not adequately monitoring subordinate CMET operations to ensure that they were collecting work load data and applying standards as prescribed.

Manpower regulations require all approved standards and guides to be applied at least annually unless they have been waived. Commands are to certify and report standards applications annually. However, we found that commands were not fully complying with application policy and that certification reports had not been monitored. Commands had not applied all applicable standards, did not have waivers for non-applications, submitted data in varying levels of detail, and reported some standards as applied when they had not been.

The Air Force has recognized that commands were not fully complying with application policy and that certification results were not monitored. In February 1985, the Air Force issued a regulation change that reemphasized standards use and the certification process. Reporting frequency of standards use was changed to a quarterly basis to allow greater control over standard applications and use. We were told that this quarterly reporting would allow Air Force technicians to monitor reported data while it was still current. We were also told that technicians would determine whether the standard was applied, whether

resulting requirements increased or decreased, whether an increase was funded, and whether application results were incorporated into the manpower data base. Further, the regulation change also incorporated actions to strengthen the waiver process. This change defined how waivers should be requested and identified situations where waivers would be approved.

Even after this change was implemented, however, we continued to find inaccuracies in reported data. Some reports did not reflect all standards applications but instead reflected only those in support functions; reported application totals were inaccurate and did not agree with application results; waivers did not exist for some standards not applied; and documentation was not readily available to support reported totals. In addition, the reports contained insufficient detail to allow a conclusive review of standards use. That is, certifications reviewed generally reported aggregated application results, not results of individual standards.

At the time of our review, the reporting format for the quarterly review was still evolving and needed specificity. The November 1985 format required only the reporting of overall results and appears to be more a compilation of information rather than a certification of standards use. Greater detail is essential if such information is to be used as a mechanism for monitoring command compliance with application policy.

We were told that some command Manpower and Organization directors periodically visit their CMETs and have a yearly CMET-commanders' conference at the command; however, the commands do not have a system for monitoring CMET compliance with established procedures. The commands perform some quality control checks on the applications—including mathematical checks, work load trends, and comparison of results with those of prior years—but do not monitor technician application practices. We believe that the lack of monitoring was a contributing factor to the errors we found.

At the time of our review, Air Force headquarters was considering a program for monitoring standardization and evaluation through periodic visits to commands and base-level CMETs to check compliance with Air Force directives. We believe that such monitoring visits would be useful and should be incorporated into the Air Force management engineering program.

Conclusions

Accuracy in Air Force manpower requirements and more efficient and effective use of existing manpower resources depend on the accurate application of approved standards. However, we found that manpower technicians had made mistakes in collecting and using accurate work load counts and in recording results. Some of these mistakes have contributed to overstating manpower requirements.

The results of our projections indicate that an estimated 7,089 positions were misstated due to standards application and recording inaccuracies. Of these misstated positions, we estimate that 3,144 were overstated and funded at an annual salary cost of over $100 million.

Standards application errors occurred primarily because technicians (1) did not independently collect and verify data, (2) used incorrect work load values, (3) did not follow prescribed directions, (4) made mathematical mistakes, and (5) did not accurately record results onto manpower documents. These mistakes were caused primarily by insufficient guidance and monitoring of standards applications.

Guidance was insufficient regarding preparing for the standards application process, reviewing the currency of work center descriptions, collecting and verifying work load, and ensuring retention of prescribed work load source documents. Further, it did not emphasize the importance of accurately recording results onto manpower documents.

Little monitoring of compliance with standards application policy was occurring. Neither Air Force Headquarters nor commands had controls for identifying which standards, Air Force or command-wide, are applicable and should be applied. The absence of controls increases the risk of using standards that are no longer applicable and creates questions about the credibility and accuracy of reported requirements. Certification reports do not require commands to certify that applicable Air Force and command standards and guides have been reviewed for currency and applied or waived if not applicable. Also, commands were not making periodic visits to ensure that base CMETs were adhering to existing manpower regulations.

Recommendations

We recommend that the Secretary of the Air Force strengthen the management controls in the standards application and recording processes of the Air Force Management Engineering Program by

- establishing improved standards application procedures and guidance to ensure that
  - standards application and recording is consistent across all commands,
  - work load counts are extracted from prescribed sources, and
  - resulting manpower requirements are accurately recorded on manpower documents;
- providing improved training on the standards application process;
- clarifying the existing 20-percent verification policy; and
- establishing a system for monitoring compliance with the verification process by incorporating controls, such as
  - a periodic certification that work load has been verified,
  - a requirement that adequate documentation be maintained until the next application cycle, and
  - an independent spot check verification of work load.

Agency Comments and Our Evaluation

DOD stated that the Air Force is taking steps to make standards easier to apply and is focusing on improving instructions on standards application and verification procedures. According to DOD, Air Force commands will also be directed to establish internal controls to preclude work load-related errors, which will be checked as part of manpower staff assistance visits. In addition, the Air Force is developing a self-paced study course for technicians dealing with standards application and work load verification.

DOD was, however, concerned that our report implied that elimination of overstatements in funded positions at the installation level will automatically result in a reduction of Air Force end strength and dollar savings. DOD noted that, due to end strength ceilings and financial constraints, Air Force total funded manpower is considerably less than requirements. Therefore, the overstatements we identified are an indication of misallocated manpower rather than excess manpower since any funded positions found to be overstated would be reallocated to fund the highest priority unfunded position. As a result, DOD believed that our projections of dollar impact are misleading and should be deleted.

We agree that a one-to-one correlation between reduced requirements and the budget or end strength should not be automatically assumed. However, we believe that reducing requirements can lead to savings.

DOD's annual budget request is based to a great extent on the requirements of each service. More accurate requirements could result in lower budget requests because the calculated shortfall—requirements minus budget request—would be smaller. In evaluating DOD's budget request, the Congress is also influenced by the services' overall statements of requirements. Also, citing the dollar amounts associated with the funded, overstated positions allows readers to gain a better perspective on the magnitude of the problem.

DOD agreed that command procedures and technician practices for applying standards were inconsistent. DOD agreed that guidance on the standards application process and training of technicians needed improvement and stated that the Air Force has already taken some preliminary steps to improve the guidance and standardized procedures for standards reapplications and step-by-step procedures for conducting the 20-percent verification are being developed for inclusion in AFR 26-1. The Air Force also plans to restructure the manpower course at Kessler Air Force Base to emphasize standards application and work load verification procedures. In addition, the command internal controls, manpower staff assistance visits, and self-paced study course mentioned earlier are also expected to help.

DOD did not agree that technicians should compare work load data submitted by functional managers with actual work load counts on a spot check basis, stating that such checks were neither realistic nor cost-effective. Since acceptance of incorrect work load data without verification was the most frequent reason for error, we believe that some kind of spot check procedure is warranted and could be implemented in a cost-effective manner.

DOD also agreed that improvements were needed in monitoring the standards application process. The Air Force has instituted a quarterly status report and a checklist to be completed during periodic manpower staff assistance visits.

DOD expressed a concern that some of our findings might suggest that manpower should be managed with rigid centralized controls in absolute detail, which DOD believes is counter to DOD philosophy of decentralizing authority and responsibility to field commanders. We did not intend to imply the need for such rigidity. However, the fact that over $100 million worth of manpower was misaligned makes a strong case for improving management controls and oversight of the Air Force manpower program.

Example: Determination of Manpower Requirements for a Pharmacy

The Air Force determines manpower requirements in several steps:

1. It determines the work load of the unit—the amount of work a unit must perform in a particular period.

2. It applies work measurement techniques—methods of analyzing work data in relation to such factors as time or costs.

3. It develops staffing standards—expressions of the time it takes a qualified worker to accomplish a defined amount of work under normal conditions.

4. It applies the staffing standards to the unit's work load to determine the unit's staffing needs or workforce requirements—the aggregate number and type of skills needed to perform an organization's work (as expressed in staff hours or values of work load factors).

5. It sets forth such requirements according to the number of staff hours of work to be performed in staffing tables.

For example, to determine the type and manpower needed for pharmacy work centers, Air Force manpower teams would first determine the work load by selecting sample sites and then gathering data on the operation of pharmacies at those sites over a certain length of time. This data would include such information as the number of prescriptions requested and filled and the amount of time spent mixing, packaging, and delivering medication; inventorying drugs; and providing consulting services.

Once the teams have gathered this data, they would apply work measurement techniques. That is, they would determine such parameters defining work as the average monthly total of prescriptions filled and average number of days of bed occupancy per month.

Out of such measurements, they would develop a staffing standard. For instance, the standard might state how many staff hours are required to operate a pharmacy dispensing 5,000 prescriptions monthly at a location with an average 2,500 days of bed occupancy per month.[3]

[3]More precisely, the actual Air Force standard for operating a pharmacy workcenter is y = 94.45 + .05928(X1) + .06584(X2) where y = the computed monthly staff-hours, X1 = the average number of prescriptions filled per month, and X2 = the average number of days of bed occupancy per month.

The teams would then apply staffing standards to the unit's work load in order to determine the staffing needs or workforce requirements of the unit. That is, they would determine the types of workers (such as pharmacist, pharmacy manager, pharmacy technician, or pharmacy specialist) needed, their grades (such as Captain, Master Sergeant, or Staff Sergeant), and their numbers.

Finally, the Air Force would set forth the requirements in a staffing table like the one shown in table I.1. For instance, using the standard referred to above, a pharmacy dispensing 5,000 prescriptions a month and at a hospital having 2,500 average days of bed occupancy per month would generate 555.45 staff hours of work monthly, which would general four requirements. According to the staffing table, the pharmacy would need a pharmacist, a pharmacy technician, and two pharmacy specialists.

Table I.1: Standard Manpower Table for Pharmacy

Air Force specialty title	Air Force specialty code	Grade	Manpower requirements[a]							
Pharmacist	9246	Lieutenant Colonel	0	0	0	0	0	0	0	0
Pharmacist	9246	Major	0	0	0	0	0	1	1	1
Pharmacist	9246	Captain	1	1	1	1	1	0	0	0
Pharmacist	9246	Lieutenant Senior	0	0	0	0	0	1	1	1
Pharmacy superintendent	90570	Senior Master Sergeant	0	0	0	0	0	0	0	0
Pharmacy technician	90570	Master Sergeant	0	0	1	1	1	1	1	1
Pharmacy technician	90570	Technical Sergeant	0	0	0	0	1	1	1	1
Pharmacy specialist	90570	Staff Sergeant	1	1	1	1	1	1	1	1
Pharmacy specialist	90570	Sergeant	0	1	1	1	1	1	2	2
Apprentice pharmacy specialist	90570	Airman First Class	0	0	0	1	1	1	1	2
Total			**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 etc.**

[a]Manpower requirements are derived by dividing the man-hour availability factor into the work center's total man-hour requirement from the standard man-hour equation computation. The availability factor is based on the average assigned and available man-hours.

The Air Force determines manpower requirements for other functions covered by MEP standards in a similar manner.

Air Force Organizations Visited

Air Force Headquarters, Washington, DC
Air Force Management Engineering Agency (AFMEA), Randolph Air Force Base, TX Manpower and Personnel, Functional Management Engineering Team, Randolph Air Force Base, TX Intelligence Functional Management Engineering Team, Offutt Air Force Base, NE
Headquarters United States Air Forces Europe (USAFE), Ramstein, West Germany Royal Air Force Bentwaters, United Kingdom Hahn Air Base, West Germany
Headquarters Tactical Air Command (TAC), Langley Air Force Base, VA Moody Air Force Base, GA Davis-Monthan Air Force Base, AZ
Headquarters Strategic Air Command (SAC), Offutt Air Force Base, NE Offutt Air Force Base, NE Malmstrom Air Force Base, MT
Headquarters Military Airlift Command (MAC), Scott Air Force Base, IL McChord Air Force Base, WA Norton Air Force Base, CA
Headquarters Air Training Command (ATC), Randolph Air Force Base, TX Sheppard Air Force Base, TX Williams Air Force Base, AZ
Headquarters Air Force Logistics Command (AFLC), Wright-Patterson Air Force Base, OH Robins Air Force Base, GA McClellan Air Force Base, CA
Headquarters Air Force Systems Command (AFSC), Andrews Air Force Base, DC Patrick Air Force Base, FL Los Angeles Air Force Station, CA

Statistical Methodology

The objective of this study was to review the application of staffing standards for Air Force positions and to estimate the accuracy of manpower requirements, both funded and unfunded, that were identified in the Air Force staffing standards program. To accomplish this objective, we developed a sampling plan that would permit extrapolation of the results of our work to a population consisting of about 70 percent of the total positions covered by staffing standards at the 95-percent confidence level with determinable confidence intervals. We reviewed our methodology with Air Force statisticians at the start of our work, and they agreed it was appropriate.

During our work, we discovered a number of errors in standards coverage and documentation inadequacies that required us to substitute standards for the ones originally selected. This substitution eventually reduced the population to which our statistical results could be extrapolated by 53 percent.

Positions Reportedly Covered by Air Force Staffing Standards

As the starting point for our sampling methodology, we obtained from Air Force officials a list of the functional areas having staffing standards and the number of positions covered by each standard. This list was ranked from the functions with standards covering the largest number of positions to the functions with standards covering the smallest number of positions. These functions had standards reportedly covering 361,734 positions at the seven commands in our study, as shown in table III.1. We determined whether a position was funded or unfunded by reviewing official manpower documents.

Table III.1: Major Command Positions Reportedly Covered by Air Force Staffing Standards (as of September 1984)

Funded positions	342,170
Unfunded positions	19,564
Total	**361,734**

Sampling Procedures

The seven major Air Force commands included 94 bases reported to have 1,000 or more positions covered by standards. From this total, we selected two bases for study during this review from each major command, using random sampling procedures. (See table III.2.)

Table III.2: Number of Bases in Selected Air Force Major Commands Having 1,000 or More Positions Covered by Standards (as Of September 1984) **And Bases Selected for Review**

Command	No. bases	Bases selected
Air Force Logistics Command (AFLC)	6	McClellan Robins
Air Force Training Command (ATC)	12	Williams Sheppard
Military Airlift Command (MAC)	15	McChord Norton
Strategic Air Command (SAC)	25	Malmstrom Offutt
Air Force Systems Command (AFSC)	5	Patrick Los Angeles
Tactical Air Command (TAC)	18	Moody Davis-Monthan
U.S. Air Force, Europe (USAFE)	13	Royal Air Force, Bentwaters Hahn
Total	**94**	

Using the list of functions, ranked by number of positions covered by standards, we grouped the functions into four sections or quartiles, each containing standards covering 25 percent of the total positions covered by standards, Air Force-wide. Our purpose for grouping the functions was to ensure that we selected standards for review that covered both large and small numbers of positions. The total population of standards in each quartile which cover positions at each of the bases selected for our sample is shown in table III.3.

Table III.3: Population of Standards, by Quartile, at Each Base In GAO Sample

Command	Base	Quartile			
		First	Second	Third	Fourth
AFLC	McClellan	70	15	43	94
AFLC	Robins	83	22	40	86
ATC	Sheppard	92	56	31	83
ATC	Williams	74	54	36	78
MAC	McChord	64	79	45	118
MAC	Norton	67	77	38	128
SAC	Malmstrom	71	70	17	106
SAC	Offutt	83	75	43	137
AFSC	Los Angeles	19	0	10	66
AFSC	Patrick	73	25	10	77
TAC	Davis-Monthan	85	78	24	134
TAC	Moody	67	69	19	105
USAFE	Bentwaters	37	67	22	109
USAFE	Hahn	71	66	20	101
Total		**956**	**753**	**398**	**1,422**

Within each quartile at each base, we selected a sample of standards to be reviewed, using independent random sampling procedures. The objective of the sampling process was to obtain two randomly selected standards from each quartile at each base, for a total of eight standards per sample base. Within each quartile, we selected more than two standards since we expected to have to substitute some standards for such reasons as necessary Air Force supporting documents not being available. Thus, within each quartile at each sample base, the actual sample size varied, depending on how many standards we had to look at until we could find two standards we could review. In order to maintain the projectability of the final sample to the study population, we intentionally provided for oversampling. However, other problems arose during the review which reduced the population to which the results could be extrapolated.

During the course of our review, we found that the reported coverage of positions for some standards selected in our sample was incorrect and that the positions were supported by other manpower- determination methods or were undocumented judgmental estimates. In addition, the population was further reduced because

- some standards we selected had not been reapplied in accordance with Air Force guidance, and therefore we could not review them; or

- source document data needed to validate standards application was unavailable.

As a result, the population of positions to which our results could be extrapolated was reduced to 170,794 positions (162,234 funded and 8,560 unfunded).

Projection Methodology

Our review used a stratified two-stage cluster sample design. To make our projections, we used the appropriate formulas for this design with the use of ratio estimators to weight our results. All estimates were made at the 95-percent level of confidence, with upper and lower confidence limits identified.

Point Estimates, Associated Sampling Errors, Lower and Upper Estimates at 95-Percent Level of Confidence

Category of positions in projectable population	Point estimate	Sampling error	Lower estimate	Upper estimate
Total	170,794	11,009	159,785	181,803
Funded	162,234	10,634	151,600	172,868
Unfunded	8,560	2,849	5,711	11,409
Overstated	5,940	2,760	3,180	8,700
Funded	3,144	2,263	881	5,407
Unfunded	2,796	1,354	1,442	4,150
Understated	1,149	760	389	1,909
Funded	14	63	1(a)	77
Unfunded	1,021	749	272	1,770
Net	4,752	3,026	1,726	7,778
Funded	3,131	2,266	865	5,397
Unfunded	1,732	1,691	41	3,423
NWL Overstated	1,392	1,030	362	2,422
Funded	379	442	7(a)	821
Unfunded	1,013	904	109	1,917
NWL Understated	977	736	241	1,713
Funded	0	0	0	0
Unfunded	977	736	241	1,713
NWL Net	413	1,298	−885	1,711
Funded	379	442	−63	821
Unfunded	36	1,189	−1,153	1,225

Legend:
NWL = non-work load related errors.
(a) = actual count.

Standard Substitutions and Population Reduction

Substitution reasons	Number of standards	Reported positions covered	Population reduction
Standard not applied due to functional review, standard development, or Commercial Activites study	74	1,080	34,730
Source document containing work load data not available	24	2,823	85,590
Standard not applicable at base because of an MSI coding error[a]	35	650	10,496
Standard not applied because the Air Force or command rescinded or waived decision[a]	19	466	20,637
Standard not applied because no waiver obtained	15	156	4,174
Not a manpower standard—MSI coding error[a]	32	1,045	23,458
Centrally applied—sample sequence satisfied with follow- up of other command-applied standards so no further validation actions taken	28	380	8,237[b]
Logistics composite model and wartime-only requirements excluded from sample so standard should not have been in sample universe	8	670	6,697
Standard not applied and other requirements in the function miscoded as standard-justified	4	54	5,379
Totals	**239**	**7,324**	**191,161[c]**

[a]Positions were reported as being covered by standards when they were actually covered by guides.

[b]Not included in positions reduced from original population.

[c]These positions when added to the adjusted population of 170,794 will not equal the original population of 361,734 due to statistical rounding.

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