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

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-214654

MAR 1 1985

The Honorable Delbert L. Spurlock
The Assistant Secretary of the Army
(Manpower and Reserve Affairs)

Attention: The Inspector General
DAIG-AI

Dear Mr. Spurlock:

Subject: Observations on the Army's Manpower Requirements
Criteria Program (GAO/NSIAD-84-78).

The purpose of this letter is to close out our survey (code 967115) of the Army's Manpower Requirements Criteria (MARC) program. MARC is the process used by the Army to determine the number of soldiers needed to perform combat support and combat service support functions in deployable units. While it is too early in the implementation of MARC to draw a final conclusion, we have some observations resulting from our survey work that we feel are important to bring to your attention.

We initiated our survey because this program leads directly into the development of Tables of Organization and Equipment for combat units which ultimately has a direct effect upon the programming and budgeting of 650,000 positions, about 57 percent of total Army manpower¹ requirements. Compensation costs alone for personnel who would fill positions determined by



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¹In the context of military personnel management, "manpower" connotes requirements or billets (positions), whereas "personnel" connotes individuals.

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the MARC program comprise \$9.4 billion² of the Army's military personnel budget. Through its role in determining the number of personnel in combat units, MARC also has an indirect impact upon the budgetary requirements for noncombat personnel, both military and civilian.

We were also concerned with the MARC program because GAO³ and Army reviews of MARC's predecessor, the Manpower Authorization Criteria (MACRIT) program, found a number of serious problems. Those problems caused Army's manpower planning to lack reliability and credibility. The Army concurred with the findings of the reviews.

The importance of having an effective manpower requirements system should be readily apparent. For example, even a one percent error could be very costly in terms of efficiency or effectiveness. If overstated, \$94 million in unnecessary costs would be expended. If understated, 6,500 personnel needed for combat support and combat service support would not be available to provide needed functions in deployable units.

Our examination revealed that initiatives to implement MARC are in the early stages, and while we are encouraged by these initiatives, we believe that if MARC is to become a reliable and credible manpower requirements determination program, the Army's development efforts need to be improved. While we found a number of problems with specific components of MARC, we believe these problems are symptomatic of a larger problem, the lack of adequate planning.

Without adequate planning, the ultimate ability of MARC to reliably determine vital combat support personnel requirements is doubtful. The Army also cannot assure the reliability of

²This estimate is based on an average compensation cost of \$14,416 per enlisted soldier. The average compensation includes: basic pay, basic allowances for quarters, variable housing allowances, subsistence, special pays and incentive pays such as hazardous duty and aviation career pay. These pays are identified in the "Department of the Army Justification of Estimates for Fiscal Year 1984", pp. 12-13. This figure does not include "cost-of-doing business" items such as uniform allowances and housing reimbursements or federal tax advantages.

³"Continuous Management Attention Needed for Army to Improve Combat Unit Personnel Requirements" (FPCD-78-61, Sept. 5, 1978). Problems addressed in this report still pertain because MACRIT standards are continuing to be used while MARC is being developed.

milestones established and estimates of persons needed to complete and implement the program. Comprehensive and rigorous planning will assure the Army and the Congress that actions to improve MARC are effective, efficient, and worth supporting.

In view of its potential impact on mission effectiveness and the Army's personnel budget, we hope that the Army will develop a comprehensive and rigorous plan encompassing both the overall program and each functional area--not just Problem Analysis Papers-- before continuing any long term efforts to improve MARC. Our concerns with specific components of MARC are discussed in more detail in the enclosure.

We would appreciate being advised of your reaction to our concerns, and of any actions you plan to take. We would, of course, be pleased to meet with your staff to discuss our concerns more fully. Because the absence of a fully developed MARC is causing both the collection and use of unreliable manpower requirements data, as well as unnecessary expenditures for obtaining it, we will continue to monitor the Army's progress by conducting subsequent reviews of MARC as final data becomes available. We also will be reviewing the related Manpower Staffing Standards System.

Sincerely yours,



Kenneth J. Coffey
Associate Director

Enclosure

BACKGROUND

In 1978, we examined and reported on the validity of MACRIT, the Army's combat support and combat service support manpower requirements program.¹ At that time, we found serious flaws in the MACRIT program which led us to conclude that the process was unreliable.

We made several recommendations concerning initiatives being made by the Army to replace MACRIT with a more reliable and credible program. We recommended that the new program be well planned, identify the program's objectives, and include Army funding, organizations, personnel and other resources needed to achieve the program's objectives, including milestones for accomplishing various program phases from design to a fully operative system. In addition to providing reliable manpower estimates, we recommended that the new program be kept up to date and methods and procedures be developed which fully document and support such estimates to include--variances among units, overlapping allowances, unit movement, and differences between wartime and peacetime estimates. We also recommended that the Army develop comparable data for functions other than maintenance. These functions include positions in the chemical, biological, radiology, engineering, medical, military police, personnel, finance and administrative, supply, transportation, and intelligence areas.

The Army concurred with our recommendations and initiated a major effort to implement them.

OBJECTIVES, SCOPE, AND METHODOLOGY

In our current examination, our objectives were to determine what progress the Army has made and what problems they have encountered in improving the determination of combat support and combat service support manpower requirements since our previous review. We met with officials of the Office of the Deputy Chief of Staff for Personnel, the Training and Doctrine Command, and the Army's Development and Readiness Command and we discussed their progress and problems in implementing the initiatives. Where available, we also examined Army plans and procedures for

¹"Continuous Management Attention Needed for Army to Improve Combat Unit Personnel Requirements" (FPCD-78-61, Sept. 5, 1978).

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developing and implementing the MARC program, and we obtained copies of pertinent reports and studies.

We performed our examination from May 1983 to January 1984 in accordance with generally accepted Government audit standards.

ARMY INITIATIVES

In 1983, the Army adopted the MARC program in an effort to improve the combat support and combat service support manpower requirements program. This new program consolidated a number of ongoing efforts. Major components completed include, among others, a prototype model to describe the use of equipment in a combat environment and to determine time needed to perform required workloads in this environment and a pilot project to test the feasibility of (1) developing the needed methodology and (2) collecting the necessary data. Other MARC components which were ongoing but not yet completed during our examination included those aimed at establishing and updating workload time, nonavailable time, indirect time, unit movement time, and worktime.

Army officials estimate that the MARC program will cost \$25 million to implement and that it will be implemented across all functional areas by 1989. Further, they indicate that 102 persons are needed to fully implement the program. We were told that these positions have been authorized for fiscal year 1984. The first application of the improved program will occur in the aircraft maintenance area. The Army plans to complete this MARC standard in February 1984.

PLANNING CAN BE IMPROVED

We recognize the complexity of this improvement program and are encouraged by Army's efforts. However, our survey revealed that the development efforts can be improved with more rigorous and comprehensive planning.

Determination of Workload

One of our concerns is the planned use of workload data. Workload defined is the time needed to perform a specific work task or function. For the maintenance function this data includes time needed to perform tasks such as overhauling the aircraft's engine.

Two existing programs adopted by the Army to obtain workload data are the Sample Data Collection (SDC) and Field Exercise Data Collection Programs. SDC is designed to provide precise performance data for effective maintenance management. Through the program, data is collected on the workload generated by selected pieces of equipment throughout the world in the garrison and field training environments. The period for each collection effort exceeds two months.

The Field Exercise Data Collection program's purpose is to record parts replaced and manhours expended replacing these parts. Unlike SDC, this data is collected during field exercises and in the European environment only. The period for each field exercise data collection effort also does not exceed two months.

Both programs rely on persons performing work tasks, such as mechanics to complete forms providing needed maintenance data. Contractors monitor these efforts and assist in collecting this data.

We are concerned about the Army's planned use of workload data in view of different methodologies and climatic conditions used by the SDC and the Field Exercise Data Collection programs. For example, given that the use of equipment may vary depending upon the unit to which it is assigned and the frequency and type of maintenance may also vary depending upon the climate, it seems inconsistent to use data with different usage and maintenance need patterns. The rationale and implications of such use also are unclear.

We believe that better planning can resolve these issues by clearly identifying and addressing the rationale and consequences of using varying methodologies and climates when gathering workload data. Without such planning the accuracy of manpower requirements for the aircraft maintenance function will be uncertain. The representativeness and usefulness of workload data will also be questionable.

Nonavailable Time

Our concerns on the "nonavailable time" factor, are on the reliability and representativeness of this data. Nonavailable time is the time soldiers need to perform tasks unrelated to their military occupational skill duties. This includes times needed for eating and taking leave. Because nonavailable time data is intended to be used in all subsequently developed MARC standards, it is essential that it be accurate. However, we have serious questions concerning this data since the information we

received indicates that the data gathering effort violated good research design practices and may not be valid or reliable for use under the program.

We were told that the questionnaire used to gather nonavailable time data was arbitrarily revised after it was pretested and that the number of interviewers and the sample size were arbitrarily reduced just prior to the administration of questionnaire. The arbitrary cancellation of the training of interviewers also casts further doubt upon the validity and reliability of this data.

Indirect Time

The representativeness, reliability and utility of data gathered to improve indirect time was also of concern to us. Indirect time defined is time needed to perform tasks that are ancilliary but necessary for work. The Army uses two categories to describe this time: task related and unit related indirect times. Unit related indirect time includes time spent attending troop meetings, classes, etc., and task related indirect time represents time needed for matters such as reading technical manuals and obtaining repair parts.

Our first concern is in regard to unit-related indirect time--whether the Army used good experimental design practices when developing this time and whether this time is valid and representative of the European environment as we were told it was. The unit related indirect time determination was part of the nonavailable time study which received several arbitrary changes and although its sample size was smaller and unit selection varied from that of the nonavailable time study, we were told that it is also representative of the European environment.

The lack of a good definition of elements comprising task related indirect time was another of our concerns. Because no clear definitions exist and limited guidance was provided persons responsible for developing this data, the probability of this time being less than reliable is high.

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We are also concerned about the future development and utilization of both unit and indirect time. We were told that although indirect time is associated with other functions, the Army only identified this time for the maintenance function in the past. Army officials we talked to were unclear on whether this data would be gathered in the future and how it would be utilized.

With more rigorous and comprehensive planning undertaken prior to data gathering, the Army's indirect time data would be more representative and reliable, saving time and money that may be required to validate this data.

Worktime

The term "worktime" is used interchangeably with productive time, available productive time, etc. It identifies the number of hours soldiers are available to perform their military occupational skill duties after deducting nonavailable, indirect, and unit movement times.

Questions regarding the reliability of this time resurfaced during our recent review when we noted that times designated for worktime varied within the Army, and the rationale and basis of such times were not always known and adequately justified.

For example, we were told that the Army's MAX-FLY program, which attempts to determine the maximum number of flying hours for helicopters--like the MACRIT program of 1978--uses 6.5 hours in its T-ARMS model, while Army documents such as a memo dated June 8, 1983 on the MARC program and the "Final Report on the Improved MACRIT Project dated October 1982" indicate that a minimum of 8 hours of worktime is reasonable for accomplishment of the wartime workload until a final decision is made based on the availability time study. We told the Army in 1978 that the 6.5 time designated was unreliable and the 8 hours designated for worktime, according to Army officials, was arbitrarily established and assigned.

Without reliable estimates for worktime which clearly identify the rationale and basis of this time, questions may continually arise about estimates of this time. The Army was reviewing the T-ARMS model to determine its applicability for MARC at the time of our review.

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The Army chose Europe as the first area of conflict, on which to develop new manpower initiatives and they are using models and war games to develop combat needs data and data on the extent and frequency of unit moves. To generate this data for the maintenance function, the Army uses two existing models: the Scenario Oriented Reoccurring Evaluation System (SCORES) and the Sustainability Prediction for Army Spare Components for Combat (SPARC).

SCORES determines how long equipment is run, miles traveled, rounds fired, etc. It also computes times needed to repair component parts and identifies the frequency and extent of unit moves. SPARC predicts damage to components of equipment given the hit probabilities of various ammunitions used. Further, it identifies repairs resulting from combat damage.

We question the adequacy, usefulness and cost/benefit of data developed by these systems for the MARC program. Among our concerns is whether equipment played in SCORES and SPARC is representative of the aircraft maintenance universe and the universe of other maintenance functional areas and, if not, whether other systems exist which will provide this data. We were told that both SCORES and SPARC are played for major pieces of equipment only and while planning documents we reviewed identified this equipment, they lacked information on how this equipment relates to the universe of aircraft maintenance and the universe of other maintenance areas.

Another of our concerns is whether the 30 days of combat data run by SCORES is sufficient to provide logistical data for sustained combat and whether this data is cost/beneficial. Early program planning documents indicated that runs of less than 90 days of combat are less than sufficient to provide logistical data for sustained combat and information we received was unclear on how the Army arrived at its 90 day and 30 day combat data need and the advantages and disadvantages of developing each data need. Moreover, we were told that it is quite costly and time consuming to generate this data. For example, although cost figures were not readily available, Army officials told us that it took 9 to 12 months to generate 30 days of combat played by SCORES for the program. The Army lacks a cost/benefit analysis of this data.

We understand the Army has efforts underway to update these war models, and the data they generate will be responsible for many of the Army manpower requirements for years to come. Therefore, it seems important to us that the Army consider the interface and possible gaps when developing this data and take a critical look at and document the assumptions and cost data underlying such models.