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# Opportunities To Reduce Costs And Improve Effectiveness Of Payroll System Operations

B-146856

Defense Supply Agency  
Department of Defense

**UNITED STATES  
GENERAL ACCOUNTING OFFICE**

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JULY 9, 1974



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

DIVISION OF FINANCIAL AND  
GENERAL MANAGEMENT STUDIES

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The Honorable  
The Secretary of Defense

Dear Mr. Secretary:

This is our report on opportunities to reduce costs and improve effectiveness of payroll system operations in the Defense Supply Agency (DSA).

We have discussed our findings in this report with DSA management officials. For the most part, corrective action has been taken to strengthen payroll system procedures.

We shall appreciate your furnishing us a copy of DSA's completed study on the feasibility of centralizing the computer processing operations of the Automated Payroll, Cost, and Personnel System and informing us of action taken on the basis of the study.


Copies of this report are being sent to the Chairmen, House and Senate Committees on Government Operations; the Chairmen, House and Senate Committees on Appropriations; the Director, Office of Management and Budget; the Director, DSA; and the Administrator of General Services.

We want to direct your attention to the fact that this report contains a recommendation to you which is set forth on page 4. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions he has taken on our recommendations to the House and Senate Committees on Government Operations not later than 60 days after the

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date of the report, and the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

Sincerely yours,

A handwritten signature in black ink that reads "DL Scantlebury". The letters are cursive and fluid, with the "DL" being particularly prominent.

D. L. Scantlebury  
Director

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ABBREVIATIONS

APCAPS Automated Payroll, Cost, and Personnel  
System

DSA Defense Supply Agency

GAO General Accounting Office

*GENERAL ACCOUNTING OFFICE  
REPORT TO THE  
SECRETARY OF DEFENSE*

OPPORTUNITIES TO REDUCE COSTS  
AND IMPROVE EFFECTIVENESS  
OF PAYROLL SYSTEM OPERATIONS  
Defense Supply Agency  
Department of Defense  
B-146856

D I G E S T

WHY THE REVIEW WAS MADE

The Defense Supply Agency (DSA) has developed a standardized, Automated Payroll, Cost, and Personnel System (APCAPS) for operation at 19 computer processing activities.

On June 30, 1973, the payroll and cost parts of the system were being operated at 9 computer processing activities and were scheduled to be operational at all 19 by June 30, 1975.

At the 9 activities, about 37,000 employees were paid about \$400 million annually through the system.

GAO reviewed the payroll portion of APCAPS as part of its broad program for reviewing the civilian pay and allowance systems in the Department of Defense. In this review, GAO also examined the potential benefits of centralizing APCAPS computer processing at a single site.

FINDINGS AND CONCLUSIONS

Processing APCAPS programs at a centralized site rather than at multiple computer sites would result in more efficient use of personnel and equipment.

The APCAPS support, design, and programing functions are currently centralized. Computer processing,

however, is performed at each user activity by computer programmers, program analysts, and computer operators. Because APCAPS' computer processing operations are standard, similar tasks in operating the payroll and cost subsystems are performed at each user activity. Furthermore, the decentralized operation restricts processing efficiency, since the system design is limited by the least capable computer installation of the user activities.

Centralization of APCAPS computer processing at a single site appears feasible and could result in net annual savings of about \$992,000 when compared to the costs of processing ASCAPS programs at 19 sites. (See p. 3.)

Several practices related to control over payroll operations require improvement to reduce the possibility of errors. (See p. 5.)

RECOMMENDATIONS AND  
SUGGESTIONS

GAO suggested that DSA make a study of the feasibility of centralizing APCAPS computer processing at a single site and recommends that the Secretary of Defense require that the processing be centralized if the DSA study concludes such a system is feasible and would result in large savings. (See p. 4.)

GAO also made several recommendations for improving the controls over the payroll operations. (See pp. 5, 6, 8, and 9.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

DSA is studying the feasibility of

centralizing APCAPS data processing and will decide what action it will take upon completion of the study. (See p. 4.)

DSA has agreed to take action to improve the controls over payroll operations. (See pp. 6, 8, and 9.)

## CHAPTER 1

### INTRODUCTION

The Defense Supply Agency (DSA) has developed a standardized Automated Payroll, Cost, and Personnel System (APCAPS). The payroll and cost portions of the system became operational in May 1970. Pilot testing for the personnel portion will begin in July 1974.

By June 30, 1973, 9 DSA computer processing activities were using APCAPS in preparing the payroll for 36,753 civilian employees. In fiscal year 1973, salaries and wages paid by these activities amounted to approximately \$400 million.

The payrolls for 18,000 more civilian employees are being processed by 10 other DSA activities which are using a system other than APCAPS. It is planned to extend APCAPS to these 10 activities by August 1974.

DSA's Functional Support Office, which operates under the direction of the Comptroller, is responsible for providing the System Design Center with technical requirements regarding changes to APCAPS and for issuing detailed operating procedures to user activities. The Center is centrally responsible for writing and changing APCAPS computer programs.

### SCOPE OF REVIEW

We reviewed the requirements and the design for the APCAPS payroll subsystem at the Functional Support Office and the System Design Center. Both activities are located at the Defense Construction Supply Center, Columbus, Ohio. At these activities we also analyzed cost and operating records to determine the feasibility of centralizing APCAPS computer processing operations and potential savings which could be achieved by this action.

We reviewed the payroll operations, including the manual and automated internal controls, at the following activities: Defense Construction Supply Center, Columbus, Ohio; Defense Depot Memphis, Memphis, Tennessee; and Defense Depot Tracy, Tracy, California.

We also examined the extent of participation by the Auditor General in developing, designing, testing, and evaluating APCAPS.



## CHAPTER 2

### POTENTIAL ANNUAL SAVINGS OF ALMOST

#### \$1 MILLION AVAILABLE BY

#### CENTRALIZING COMPUTER PROCESSING OPERATIONS

We estimate that DSA can save \$485,000 annually through centralizing nine existing APCAPS computer processing operations. These annual savings would increase to about \$992,000 beginning in fiscal year 1975, when 10 additional DSA activities are included. Savings would be realized by eliminating parallel or similar tasks performed by each activity using the APCAPS payroll and cost subsystems.

#### INEFFICIENCIES OF CURRENT DECENTRALIZED OPERATIONS

Processing APCAPS programs at a centralized site rather than at multiple computer sites would result in more efficient use of personnel and equipment. In the APCAPS decentralized computer processing operation, each activity unnecessarily performs like or similar tasks in operating the payroll and cost subsystems. Furthermore, the decentralized operation restricts processing efficiency, since the system design is limited by the computer equipment capabilities at each user activity.

The APCAPS support, design, and programing functions are currently centralized. Computer processing, however, is performed at each user activity by computer programers, program analysts, and computer operators. Because APCAPS' computer processing operations are standard, like or similar tasks are performed at each user activity.

Because the APCAPS computer processing operation is decentralized, the effectiveness of the standard design is limited by the least capable computer installation of the user activities. Thus the system design restraints preclude DSA from taking full advantage of more efficient programing techniques. For example, at each location 42 percent of the APCAPS computer programs used in the payroll subsystem involve data-sorting operations. System Design Center officials informed us that, if the APCAPS payroll subsystem was centralized, many computer sorts could be greatly reduced by

using more efficient off-line storage media and random access processing methods.

When APCAPS is expanded to include 10 additional user activities in fiscal year 1975, its current computer programs cannot be used for the computers at these sites because of differences in computer equipment. The System Design Office, therefore, has developed a program to convert the present computer programs to programs usable on the equipment at the 10 sites. If the conversion program, which has not yet been tested, does not operate properly, substantial reprogramming will be needed. Further, maintaining the computer programs for different types of computer processing equipment will present system design and administrative problems.

We believe that the inefficiencies in the current decentralized APCAPS system can be eliminated by centralizing the computer processing at one site. If the centralization is effected before the expansion of the system to 10 additional activities, the conversion and related operating problems could be avoided.

#### OPPORTUNITY TO REALIZE SAVINGS BY CENTRALIZING COMPUTER PROCESSING OPERATIONS

We estimate that DSA could save \$485,000 annually through centralizing nine existing APCAPS computer processing operations and that these savings could increase to about \$992,000 in fiscal year 1975 when 10 additional activities are added to the system. The gross estimated savings were based on the potential (1) reduction of workloads at user activities of computer analysts, programmers, and operators and (2) increased availability of computer processing time at each activity for supply or other mission-related programs. To determine the net estimated savings, we considered the additional costs that would be incurred at the central processing site for (1) computer operators and additional computer equipment and (2) increased computer processing time.

The following schedule shows the computation of the estimated annual savings.

	<u>9 sites</u>	<u>19 sites</u>
Savings factor:		
Reduction of personnel costs	\$ 256,000	\$ 608,000
Released computer-processing time	<u>799,000</u>	<u>1,331,500</u>
Gross savings	<u>\$1,055,000</u>	<u>\$1,939,500</u>
Less additional costs:		
Computer operations and computer equipment	279,500	574,500
Increased computer-processing time	<u>290,500</u>	<u>373,500</u>
Total additional costs	<u>570,000</u>	<u>948,000</u>
Net savings	<u>\$ 485,000</u>	<u>\$ 991,500</u>

Systems Design Center officials agreed that our estimates included the major factors that should be considered in determining the economic benefits of centralization and that significant economies would result from this action. They also said the centralization would not delay the issuance of APCAPS labor cost reports and employee paychecks.

Accordingly, we suggested that DSA study the feasibility of centralizing the APCAPS computer processing system. DSA initiated a study and, in April 1974, told us its preliminary findings. Although centralization would require additional computer capacity, the cost of operating it would be considerably less than for the present decentralized operation.

#### Recommendation

We recommend that the Secretary of Defense require that APCAPS computer processing be centralized if the DSA study concludes such a system is feasible and would result in large savings.

## CHAPTER 3

### NEED TO STRENGTHEN PAYROLL SYSTEMS PROCEDURES

There were opportunities to improve the payroll system's procedures which would reduce errors. Also, a change to the computer program for leave and pay history files could reduce computer processing time and save about \$30,000 annually.

### NEED FOR SUPERVISORY REVIEW OF UNUSUAL AND ABNORMAL TRANSACTIONS

The payroll system did not provide for an independent review of transactions which bypassed programmed controls for propriety and accuracy. As a result, transactions have been erroneously prepared and processed through the subsystem. For example, one employee was erroneously paid \$25,161.60 for a biweekly pay period. This resulted when a payroll clerk made an erroneous manual pay calculation for a retroactive pay entitlement. When the transaction was entered into the computer system, it bypassed a programmed control which would have reduced the pay to the statutory limit of \$1,344.80 and printed an error notice for followup action. The overpayment was not detected until the employee reported it to the payroll office.

The transactions which bypass the programmed controls in the payroll subsystem include manually computed payments and nonstandard pay and leave changes--for example, corrections and adjustments applicable to prior pay periods, retroactive pay increases, and other transactions for which the computer has not been programmed. Because such transactions are not checked by the programmed controls, they should be independently reviewed to insure that only authorized and correct transactions enter the system for processing.

#### Recommendation

We recommend that the Chief of the Functional Support Office require the preparation of a separate list of unusual and abnormal transactions for review and approval by payroll supervisors before issuance of checks.

### Agency action

DSA officials said that a separate list of unusual and abnormal transactions will be prepared and that a responsible official will review and approve these transactions.

### NEED TO UPDATE APCAPS ERROR MESSAGE EXPLANATIONS

In some cases, operating personnel at user activities could not properly evaluate and correct error conditions cited in computer-printed error messages, because the explanations of these coded messages were not current.

The computer prints error messages for those transactions which exceed or violate computer-programed controls. These messages are coded and, therefore, do not contain sufficient information to describe the error.

The Functional Support Office is responsible for maintaining the explanations of the error messages and distributing them to personnel who are required to analyze the errors. DSA officials said that, due to the heavy workload involved in the development of the personnel subsystem, the Office did not furnish a current list of APCAPS error message explanations to user activities.

### Recommendation

We recommend that, to insure that errors are properly evaluated, the Chief of the Functional Support Office update the APCAPS error message explanation listing and distribute it to user activities.

### Agency action

DSA officials said they have initiated action to provide user activities with the required updated list.

### PAYROLL PROBLEM- REPORTING PROCEDURES SIMPLIFIED

Many of the problems experienced by payroll clerks at user activities were not being reported, though required, to the Functional Support Office. This occurred because the procedure for communicating problems in the payroll subsystem requires the furnishing of information not readily available to payroll clerks.

An effective internal control procedure regarding the notification of technical problems requires prompt reporting of problems for analysis and corrective action. DSA regulations require that, when reporting problems with the APCAPS payroll subsystem, the user activity provide (1) detailed documentation of the problem, (2) sample input and output illustrating the technical problem, (3) complete justification for recommended corrective actions, and (4) cost savings and other benefits. DSA requires that this information be reported to the Functional Support Office.

Some user activities were not reporting problems with the payroll subsystem because not all the information was readily available and compliance with the reporting requirements involved extensive time and effort.

To insure that timely action is taken to correct problems in the payroll subsystem, we suggested that the Chief of the System Design Center reduce the reporting requirements and permit reporting in a less formal manner. DSA officials advised us that the requirements have been simplified and user activities have been authorized to report computer program and other technical problems by telephone or letter.

#### NEED TO IMPROVE EVALUATION AND TESTING OF COMPUTER PROGRAM CHANGES

The Functional Support Office has not maintained a program of testing and evaluating the payroll subsystem computer programs. As a result several deficiencies in computer programs remained undetected until our review.

The Office provides the Systems Design Center with requirements for programming the payroll subsystem. The Center is responsible for translating these requirements into computer programs and making changes to the APCAPS payroll subsystem. During the development, the Office tested and evaluated the Center's work to insure that the computer programs conformed to its requirements. Test and evaluation of subsequent major changes to the payroll subsystem, however, were not performed. These changes relate to revisions in pay rates, taxes, insurance, retirement, payroll reports, and correction of reported programming errors.

Several deficiencies in computer programs remained undetected until we tested them. For example, our tests showed that it was possible to change an existing employee's master pay record if a new hire was added to the system erroneously using the existing employee's social security number. The computer program incorrectly processed the new hire as a name change and entered new personnel background information on the existing employee's master file record instead of rejecting the input as an invalid transaction. Proper testing and evaluation of the computer program by the Functional Support Office could have disclosed this and other program deficiencies before our review.

### Recommendation

We recommend that, to provide greater assurance that the computer programs perform effectively and process only valid data, the Director, DSA, require the System Design Center to test and evaluate important changes in APCAPS computer programs.

### Agency action

DSA officials advised us that they are reviewing their current testing procedures. They agreed that our recommendation has merit and, to the extent practicable, they plan to implement such procedures.

### NEED FOR AUDITOR GENERAL TO REVIEW PERSONNEL SUBSYSTEM BEFORE IMPLEMENTATION

The Auditor General's staff participated to a limited extent in reviewing the APCAPS design but did not participate in development, test, and evaluation before implementation.

We believe that the internal audit staff can effectively insure that adequate internal controls are included in a system by actively participating in the design, development, test, and evaluation of the system.

A major design effort is underway to complete the personnel subsystem. Because APCAPS is an integrated system, the personnel and payroll subsystems are interdependent. Thus the processing of the payroll could be adversely

affected, if adequate internal controls are not provided for in the personnel subsystem.

#### Recommendation

We recommend that DSA's Auditor General review the personnel subsystem before it is placed into operation to insure that adequate controls have been established and actively participate in the design, development, test, and evaluation of future automated systems.

#### Agency action

DSA will study the feasibility and merits of having the Auditor General's staff review new data processing system applications before implementation.

#### COST OF PROCESSING PAY AND LEAVE HISTORY RECORDS REDUCED

The APCAPS system design required the maintenance on magnetic tape of an annual earnings and leave record for each employee. This record showed the detailed earnings and leave of each employee for each pay period during the year. These records were quite large, and grew larger every pay period, requiring much computer time to update. To update a tape record, it is necessary to copy the data from the previous tape onto the new tape as well as to add the new data to the tape.

The system also required that the entire records be printed out quarterly on specially preprinted forms. This resulted in unnecessary printing. The first quarter's detailed earnings, for example, were printed out four times during the year; i.e., at the end of each quarter. This unnecessary printing consumed computer time and printed forms.

We suggested that, instead of maintaining the detailed history file on a single, cumulative tape, a new tape be started each quarter and that only the year-to-date totals be carried forward from the previous file. This would reduce the volume of the files passed through the computer by about 75 percent and reduce computer processing time.



We also suggested that only the current quarter's detailed earnings and year-to-date totals be printed out at the end of each quarter, thereby reducing computer time used for printing and the consumption of printed forms by about 55 percent.

DSA revised the system in accordance with our suggestions and, as a result, will save about \$30,000 a year in computer time and printed forms at the nine installations currently operating APCAPS. We estimate \$10,000 more a year will be saved when APCAPS is extended to the remaining 10 activities.

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