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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Improvements Needed In Operating And Using The Army Automated Facilities Engineer Cost Accounting System

The Army's automated Facilities Engineer Job Order Cost Accounting System was devised to help manage a work force of about 45,000 employees charged with $2.6 billion in facility maintenance and repair projects each year. Although GAO approved the system design in 1977 with the understanding that two design deficiencies would be corrected, the system has not been effectively implemented. Army managers are not using the system. As a result (1) there is little incentive to make sure that system data are accurate, complete, and timely and (2) managers do not know whether maintenance and repair operations are being accomplished efficiently. GAO is making recommendations for more effective use of the system and for improving the quality of the system's data.

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MAY 19, 1982

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This report discusses the need for the Army to make improvements to its automated Facilities Engineer Job Order Cost Accounting System and to make better use of that system in managing the operation and maintenance of real property facilities. Our review was made to determine whether the Army was operating and using the system in accordance with the approved system design.

Copies of the report are being sent to the Director, Office of Management and Budget and the Secretary of Defense.

Charles A. Bowsher

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

IMPROVEMENTS NEEDED IN OPERATING AND USING THE ARMY AUTOMATED FACILITIES ENGINEER COST ACCOUNTING SYSTEM

D I G E S T

The Army's automated Facilities Engineer Job Order Cost Accounting System, which was designed to help facility engineers efficiently manage a work force of about 45,000 employees at Army installations around the world, is not effective:

--The information it generates is not being used by management.

--Data are not being entered accurately or promptly.

--Two design deficiencies pointed out by GAO 5 years ago have still not been corrected.

--Training of user personnel has not been continued at an adequate level after conversion to the system.

--It generates cumbersome reports in formats that discourage use of the data.

Because the cost accounting system is generally not being used, and because of the uncorrected design deficiencies, the data produced are inaccurate and untimely. Also, facility managers are not being held fully accountable for maintenance and repair project costs. In fiscal 1980, more than $2.6 billion was spent by the Army on these projects.

GAO approved the design of the cost accounting system in July 1977 with the understanding that the Army would correct two design deficiencies affecting the accuracy of cost data. GAO's review was made to determine whether the system was being implemented and operated in accordance with the approved system design and was being used by management.

The Army has already invested a lot of time and money designing and implementing this cost accounting system, which is part of an overall management information system known as the Integrated Facilities System. As of January 1982 the cost accounting system had been implemented at about 70 installations. Ultimately, the Army anticipates extending

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it to about 150 installations around the world. However, the Army has not convinced users that the system is sound and could lead to more efficient and effective operations. Until the Army enforces a requirement for facility managers to use the system, inaccurate and untimely data will continue to be produced and no meaningful benefit will be realized from the system. Before implementing the system at the remaining installations scheduled for conversion, the Army should make sure the problems discussed in this report are corrected.

SYSTEM NOT BEING EFFECTIVELY USED BY MANAGEMENT

At installations GAO visited, cost accounting system data were not being effectively used to manage facility engineer operations. Most importantly, managers were not being held fully accountable for project costs incurred. Current Army regulations require that variances in labor hours exceeding 10 percent on any project be analyzed and explained in writing. Generally, however, neither these variances nor frequent large variances between other elements of job expense were being researched or explained. (See p. 4.)

GAO's work showed that the reported actual costs incurred on 78 percent of the projects at installations visited varied by more than 10 percent, either over or under, from the estimated project costs. On 40 percent of the projects reviewed, reported actual costs varied by more than 50 percent from estimated costs. Because managers did not research these variances, they did not know why the variances occurred and what, if any, corrective action was needed. (See p. 5.)

Effective review of project costs, especially when those costs vary significantly from estimates, is necessary if management is to determine whether funds are being used efficiently. Where problem areas such as poor cost estimating or work force inefficiencies are identified, appropriate corrective actions should be taken. This should not only improve the efficiency of operations, but could also help to reduce the growing backlog of maintenance and repair projects, recently valued at about $2.1 billion. (See p. 7.)

THE SYSTEM DOES NOT CONTAIN ACCURATE, COMPLETE, AND TIMELY INFORMATION

Because Army managers were not using the system, operating personnel had little incentive to make sure system data were accurate, complete, and timely. At installations GAO visited, inaccurate individual labor rates were often being used for computing project costs, labor costs were not being properly allocated to individual projects, and many transactions were not being posted promptly to the cost accounting records. (See p. 8.)

SYSTEM DESIGN DEFICIENCIES STILL PERSIST

GAO approved the design of the Army's automated Facilities Engineer Job Order Cost Accounting System 5 years ago with the understanding that the Army would correct problems in the procedures for (1) accumulating certain types of actual costs against individual jobs and (2) controlling data rejected by the system until the data were corrected and reentered. The Army, however, has still not fully resolved either of the conditions, and the uncorrected problems are contributing to the inaccuracy of the current cost accounting system data. (See p. 10.)

ADEQUATE TRAINING NOT PROVIDED TO USER PERSONNEL

The Army has failed to provide adequate formal training to cost accounting system user personnel. The training that has been provided has covered only certain aspects of system operations and generally has been limited to that given during the conversion process. Because of this and because of the high rate of personnel turnover, many individuals now involved in the day-to-day operation of the system at installations GAO visited had never received any formal training. An outside consultant hired by the Army also pointed out this problem in 1979. The lack of sufficient training of operating personnel as well as managers has contributed to the overall ineffectiveness of the job order cost accounting system. (See p. 13.)

SYSTEM REPORT FORMATS DISCOURAGE USE

Because cost reports produced by the system are so lengthy and do not present data in convenient formats, facility managers have been reluctant to attempt to use the reports. For example, to identify

those projects involving significant cost overruns or underruns, management must review a listing of all existing project orders, an extremely time-consuming effort. Better use should be made of management exception reports to present data in a more usable length and format to highlight information warranting management's attention. (See p. 13.)

CONCLUSIONS

The Army's ineffective use of its automated Facilities Engineer Job Order Cost Accounting System indicates insufficient management emphasis on the importance of such a system in achieving efficient operations. GAO still believes that this system, with the incorporation of the design changes recommended 5 years ago, would be a good system if properly operated.

The system proponents' responsibilities, which include establishing policy and setting system objectives, do not end with designing the system. The proponents must also make sure that operating personnel are adequately trained and that the system is used. Until officials begin to use the cost information in the system to manage the operation and maintenance of Army facilities, inaccurate and untimely data will continue to be produced and no meaningful benefit will be realized from the funds spent to develop the system.

RECOMMENDATIONS

GAO recommends that the Secretary of Defense have the Secretary of the Army

--direct installation operating personnel to prepare and enter cost information into the system in an accurate, complete, and timely manner;

--revise cost report formats to permit ready use by management and to include more use of management exception reports;

--correct the two system design deficiencies identified by GAO when it approved the system;

--adequately train system users to operate the system and use its reports; and

--make sure through periodic review that managers use the cost data and other information contained in the automated Facilities Engineer Job Order Cost Accounting System to effectively maintain and operate Army facilities.

Further, GAO recommends that the Secretary of Defense take these actions before the system is implemented at the remaining installations scheduled for conversion.

AGENCY COMMENTS

Army officials generally agreed with all findings and concurred with the recommendations aimed at improving the operation and use of the system and training system users. Regarding GAO's last recommendation--that all other recommended actions be completed before the system is implemented at additional installations--the Army said it was inclined to agree, but wanted further coordination within the Department before responding.

Contents

CHAPTER 1

INTRODUCTION

Army facility engineers are responsible for maintaining and improving Army real property in support of the Army mission. Facility engineering projects include renovating and improving existing facilities; minor construction; installing, removing, replacing, and repairing equipment and parts; and maintaining and repairing grounds, pavement, and facilities. The projects are performed by individual shops specializing in such areas as carpentry, painting, structural maintenance, and electrical work. Facility engineers are responsible for identifying and verifying the need for work to be done, establishing work orders describing each project, planning and estimating the costs of each job, scheduling and accomplishing the work, and reviewing and evaluating work results.

One of the most important tools available for facility engineer management is a sound job order cost accounting system. Such a system is needed to effectively measure and evaluate the efficiency and economy of the use of resources.

According to Title II of GAO's Policy and Procedures Manual for Guidance of Federal Agencies, a cost accounting system should "systematically measure and assemble all significant elements of cost incurred in accomplishing a specific purpose, carrying out an activity or operation, or completing a unit of work or a specific job." Further, Title II states "The availability of reliable cost information, particularly when related to assignments of management responsibility, is also of great value in promoting in responsible officials and employees desirable attitudes of cost consciousness which are so important to conducting operations economically."

DEVELOPMENT OF AN AUTOMATED JOB ORDER COST ACCOUNTING SYSTEM

Until several years ago, Army installations accomplished facilities engineering job order cost accounting through primarily manual systems. As management's need for more comprehensive cost data grew, however, the capability of these manual systems to promptly provide the necessary information diminished.

In an attempt to maximize utilization of its resources, the Army in 1971 initiated development of a standard automated facilities engineer job order cost accounting system. As an integral part of an overall automated standard management information system known as the Integrated Facilities System, the new cost accounting system was designed to accumulate and report estimated and actual costs incurred in the operation and maintenance of real property facilities regardless of the funding source, and to record and report individual job order costs to ensure compliance with various statutory limitations.

IMPLEMENTATION OF THE JOB ORDER COST ACCOUNTING SYSTEM STILL IN PROCESS

The Army began conversion to the automated system in 1976 and originally planned to extend it to approximately 150 installations around the world. To date, implementation has reached about 70 installations within the United States, Korea, and Japan. Those installations not yet converted to the system are primarily U.S. Army Materiel Development and Readiness Command activities within the United States (scheduled for conversion in fiscal 1984) and activities located in Europe.

SYSTEM DESIGN APPROVED BY GAO

In December 1976, the Army submitted the design of the automated Facilities Engineer Job Order Cost Accounting System to us for approval as required by the Accounting and Auditing Act of 1950. In July 1977, we approved the design, with the condition that it would be changed to (1) include an automated error suspense file and suspense clearing procedures and (2) account for certain charges being excluded from the costing of individual job orders. As discussed in more detail on pages 10 to 12, the Army has not yet fully accomplished either of these changes.

OBJECTIVES, SCOPE, AND METHODOLOGY

This review was made pursuant to our responsibilities under the Accounting and Auditing Act of 1950 for periodically reviewing agency accounting systems. We wanted to determine whether the system was being implemented and was operating as designed by the Army and approved by us, and whether installations were using the system to manage facility engineer operations.

The review was made in accordance with our current "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions." We interviewed responsible officials, reviewed Army regulations and guidance, and read prior audit reports related to facility engineer functions. Our work was performed at the Office of the Chief of Engineers, Washington, D.C.; the Facilities Engineering Support Agency, Ft. Belvoir and Ft. Lee, Virginia; Ft. Carson, Colorado; Ft. Shafter, Hawaii; Yongsan Garrison, Korea; and Ft. Dix, New Jersey. Ft. Carson processes cost accounting transactions for Ft. Douglas, Utah, and Ft. Dix processes transactions for Ft. Hamilton, New York. We included cost accounting data from both of those satellite activities in our review.

The Office of the Chief of Engineers was included in the review because it is the proponent for the cost accounting system, responsible for establishing policy and setting system objectives, and the Facilities Engineering Support Agency because it has functional responsibility for the system. Ft. Carson and Ft. Dix were selected for review to determine whether cost accounting system problems reported by the Army Audit Agency in 1978 had been corrected. Ft. Shafter was selected because it is the largest user of Army operation and maintenance funds for maintaining real property. Yongsan

Garrison, which was in the process of implementing the automated system, was selected so that we could assess the training given during conversion.

Further, we developed and executed an automated data retrieval and report program to compile certain cost data and calculate the differences between estimated and actual cost for each completed job order. Using this program, we reviewed all 6,541 job orders completed during the first 9 months of fiscal 1981 at Ft. Dix, Ft. Hamilton, Ft. Carson, Ft. Douglas, and Ft. Shafter and those completed in fiscal 1980 at Ft. Shafter. We did not review the fiscal 1980 job orders at the other four installations because the automated files had been discarded.

We also took a statistical sample of labor and equipment transactions at three locations to determine how long it took to enter actual cost data into the system. During the first 7 months of fiscal 1981, 301,997 labor and equipment transactions containing actual job order cost data were processed at Ft. Dix, Ft. Carson, and Ft. Shafter. These transactions are required to be entered into the system daily. Our statistical sample was as follows:

Location	Number of transactions	
	Universe	Sample
Fort Dix	92,750	159
Fort Carson	103,117	185
Fort Shafter	106,130	125
Total	301,997	469

We did not execute the automated data retrieval and report program or take a statistical sample of the labor and equipment transactions at Yongsan Garrison in Korea because the system had not been fully implemented at the time of our visit.

CHAPTER 2

FACILITY ENGINEERS ARE NOT EFFECTIVELY USING COST ACCOUNTING DATA TO MANAGE OPERATIONS

The Army is not effectively utilizing its automated Facilities Engineer Job Order Cost Accounting System. The goal of the system is to help facility engineers efficiently manage a work force of about 45,000 employees engaged in operating and maintaining real property at a cost of about $2.6 billion annually. The Army owns real property facilities with an estimated replacement value of $137 billion. Although cost reports produced by the system continually showed frequent, often large, variances between estimated and actual costs incurred for facility engineer projects, managers have not been held responsible for researching and explaining these variances or using other cost information produced from the system. Further, because Army managers were not using the system's reports, operating personnel had little incentive to make sure that system data were accurate, complete, and timely.

Any large commercial business in the repair and maintenance field would have difficulty remaining solvent if it did not rely upon a sound cost accounting system in managing daily operations. Effective use of such a system can identify waste and other inefficiencies and show where corrective action is needed.

The Army should make its facility maintenance and repair managers more conscious of project costs. For example, managers should be required to research and explain significant variances between estimated and actual project costs. Also, the Army should correct the two design deficiencies that we pointed out when we reviewed the system design in July 1977. Better utilization of the cost accounting system should lead to improved facility engineer operations by identifying problem areas such as work force inefficiencies. Corrective action applied to these problem areas should help reduce the increasing backlog of facility engineer projects, currently valued at over $2.1 billion.

MANAGERS ARE NOT EFFECTIVELY USING SYSTEM DATA

At Army installations we visited, job order cost accounting data was not being utilized to effectively manage facility engineering operations. Although the cost accounting system showed numerous large variances between actual and estimated facility engineer job costs, managers were not being held accountable for researching or explaining the causes of these variances; consequently, they did not know why the variances occurred.

One of the most important management tools available to facility engineers is a sound cost accounting system. Accurate and timely job order cost data enable management to assess the

efficiency of operations by comparing (1) actual job costs to estimated costs, determining reasons for variances; (2) the proficiency of operations among shops; and (3) the costs of performing similar projects during different periods. Management can then identify areas for improvement and for better utilization of resources. Without ready availability or effective use of such cost data, management cannot know whether operations are being conducted efficiently.

Job cost variances are not adequately analyzed

Large variances between estimated and actual job costs, which could indicate the existence of serious problems, warrant management's attention. While Army regulations currently require written explanation when actual and estimated job labor hours vary by more than 10 percent, large variances between actual and estimated costs for any significant element of expense for a job--including, for example, material and contract costs--should be researched to determine their causes.

Variances between reported actual and estimated job costs can stem from a number of things including inaccurate initial project cost estimates, failure to properly revise estimates when the scope of planned projects is changed, inefficient work performance, and inaccurate accounting for actual job costs. It is important for management to be aware of the causes of these variances so that, when appropriate, action can be taken to improve the accuracy of estimates or accounting for actual costs, or otherwise improve overall efficiency of operations. At installations we visited, variances were seldom being analyzed.

In order to determine the percentage of jobs that were costing significantly more or less than estimated, we developed an automated data retrieval and reporting program and applied it against the automated job order files at each installation visited except Yongsan Garrison. We looked at 100 percent of the completed job orders from October 1980 to June 1981 at Ft. Dix, Ft. Hamilton, Ft. Carson, Ft. Douglas, and Ft. Shafter. We also looked at fiscal 1980 completed job order data at Ft. Shafter. Fiscal 1980 data for the other four installations had been discarded prior to our review.

For the 6,541 job orders reviewed from five installations, using the data in the cost accounting system, we found that 5,098 or 78 percent of all actual job order costs varied by more than 10 percent from estimated costs, including both overruns and underruns. Forty percent of actual job costs varied by more than 50 percent from estimated costs. Because managers did not research these variances, they did not know why the variances occurred (i.e., poor estimates or inefficient work performance) and what, if any, corrective action was needed. Results of our work are shown below.

Installation	Total projects reviewed (note a)	Extent of variances between actual and estimated project costs (note b)		
		10 percent or less	11 to 50 percent	Over 50 percent
Ft. Dix	1,089	327	454	308
Ft. Hamilton	1,206	360	496	350
Ft. Carson	1,409	393	530	486
Ft. Douglas	126	21	44	61
Ft. Shafter	2,711	342	972	1,397
Total	6,541	1,443	2,496	2,602
Percentage of total (note c)		(22.1)	(38.2)	(39.8)

a/Includes three types of work orders: individual job orders, special projects, and standing operation orders.

b/Includes both overruns and underruns of job order estimates.

c/Figures do not add to 100 percent due to rounding.

Because job cost estimating is not an exact process, certain levels of variances between estimated and actual job costs are expected to occur. However, making reasonable initial cost estimates, updating those estimates as the nature or scope of planned work changes, and accurately accounting for all actual job costs incurred, should minimize these variances. Further, proper analysis of variances as they occur should enable management to reduce or eliminate them in the future and thereby improve the efficiency of operations, including the utilization of personnel resources. We believe that the extent of variances shown above indicates serious inefficiencies in facility engineer operations and/or inaccuracies in cost accounting system data.

We randomly selected and reviewed completed job orders with large variances to determine the nature of those variances. Examples of the results of our review are described below.

--The planning branch at Ft. Shafter estimated the cost to fabricate, install, and paint metal security doors and screens for a local Air Force installation to be $2,483. The initial work request submitted by the customer authorized funding not to exceed $4,000. Although several amendments to the work order increased the scope of the work to a new estimated cost of $7,748, the modification documents did not indicate that the additional work and costs had been properly approved by the customer or by Ft. Shafter facility engineer management. The final actual cost of the

project was $19,834 or 156 percent over the revised estimate. Despite these large differences, no variance analysis was done and management could not explain the reasons for the large cost overruns. This was one of 1,200 projects completed at Ft. Shafter in fiscal 1980.

--To establish a job number in the cost accounting system for a project on which no actual estimate of job costs had been done, the planning branch at Ft. Dix showed an estimated cost of $12, or $1 for each of 12 phases of work to be performed under the job. Ultimately, the actual cost of the job as shown in the job order cost accounting system was $10,653. Despite such a large descrepancy between the actual and recorded estimated job costs, the project folder contained no explanation of the cost variance nor any documentation on the actual cost incurred on the job. Officials agreed that after using fictitious estimates to establish a job order number, an actual project cost estimate should have been made and entered into the system. They did not know why this had not been done. Without it, of course, they were not able to assess the efficiency of performance on the job.

--The planning branch at Ft. Shafter estimated the cost of replacing a transformer at $5,415 including material costs of $3,000. The total actual cost of the project was $8,526, representing a 57.4 percent cost overrun. Actual material costs were $6,233 or 107.8 percent over the estimate. The variances were not analyzed to determine why actual costs were so far in excess of estimates.

In 1980, we reported on problems in the Air Force similar to those we found in the Army. 1/ There, too, reported differences between estimated and actual maintenance and repair project costs were not being researched to determine the causes.

Project costs are not given enough emphasis

Effective review of project costs is essential if management is to know how efficiently funds are being used. Especially when project costs vary significantly from estimates, these reviews can identify problem areas such as inaccurate estimating methods or work force inefficiencies. Appropriate corrective actions should not only improve the overall efficiency of facility engineer operations but also help reduce the backlog of projects, which had grown to about $2.1 billion as of September 30, 1980. The Office of the Chief of Engineers has not fulfilled one of its most important responsibilities as system proponent: to convince users that the system is sound and can be used to achieve more efficient operations.

1/"Air Force Civil Engineer Cost Accounting System Reports Should Be Used More Effectively" (FGMSD-80-12, Jan. 16, 1980).

As a result, installation managers have generally not used the system to manage facility engineer operations. Until those managers begin to effectively analyze and react to cost data, inaccurate and untimely data will continue to be produced by the system and no meaningful benefit will be realized from the significant amount of funds spent to develop the system.

COST ACCOUNTING SYSTEM DATA ARE NEITHER ACCURATE NOR TIMELY

At installations we visited, cost accounting system information was often inaccurate, incomplete, and not timely. Because facility managers were not using the cost accounting reports, operating personnel had little incentive to make sure that cost data were properly maintained. Pay rates used to calculate job costs were often inaccurate, labor costs were not always properly allocated, and many transactions were not promptly posted to the cost accounting system.

Pay rates used to calculate job labor costs are often inaccurate

At two of the four installations visited, we found inaccuracies in the pay rates used to compute job labor costs. This was usually the result of failure to update the cost accounting system with pay rate increases. For example, at Ft. Dix a general wage rate increase effective on October 1, 1980, affecting 349 employees, was not entered into the cost accounting system until December 5, 1980--65 days later. Another general increase effective on December 14, 1980, affecting 316 employees, was not entered into the system until January 14, 1981--31 days later. As a result, the actual costs were understated for all jobs on which the affected employees worked between the date of the rate increase and the date the change was entered into the system. At Ft. Dix, we compared individual pay rates in the job order cost accounting system to those in the Standard Army Civilian Payroll System and found that rates differed for 138, or 31 percent, of the 450 wage board employees of the Directorate of Engineering and Housing. Officials told us the differences were usually due to delays or errors in updating or failure to update the cost accounting system when pay data changed. At Ft. Shafter we also found several examples of erroneous individual wage rates in the cost accounting system and delays in adding new employees to the system data base.

Without correct and complete wage rates for all facility engineer employees, total actual job costs cannot be accurately accounted for.

Labor suspense account balances are not accurately analyzed and distributed

Installations we visited were not monitoring labor costs to ensure that they were properly entered into the cost accounting system. Army guidelines specify that all civilian payroll costs

must be allocated against existing work orders so that the total cost of each job will be reflected. To help ensure that these payroll costs are properly absorbed, the Army established a labor suspense account. The account is used to identify and track any differences between total facility engineer civilian payroll costs and cumulative labor charges against all existing work orders. Differences between the two amounts usually stem from errors in the cost accounting system data base. Such errors can result from erroneous, missing, or duplicative labor cost input, inaccurate wage rates in the job order cost accounting system, or erroneous shop overhead rates.

According to existing Army guidelines, differences between the payroll and cost accounting labor charges should be distributed quarterly to various Army management structure accounts. Differences of less than 5 percent of total payroll costs are to be prorated according to other historical expenditure data. However, differences exceeding 5 percent are considered by the Army to indicate potentially significant problems in the accounting for labor charges and should be researched to determine their causes. The differences should then be distributed according to the results of that research. These analyses and distribution procedures were developed by the Army using suggestions we made when we approved the cost accounting system design 5 years ago.

Our review showed that at both Ft. Shafter and Ft. Dix unreconciled balances were excessive, were not properly analyzed, and were not distributed when they should have been. For example, at Ft. Shafter during the first quarter of fiscal 1981, facility engineer civilian employees had been paid about $540,000 more than those employees had charged against existing job orders. This difference represented about 15 percent of the total civilian payroll cost. At the end of the same quarter, similar differences at Ft. Dix totaled $426,000 or about 17 percent of the total civilian payroll cost. Despite these excessive differences, the residual balances were not researched, analyzed, or explained. They eventually were distributed according to the rates used for differences under 5 percent, which could have significantly distorted the distribution of labor costs to the Army management structure code. Further, neither Ft. Shafter nor Ft. Dix was making timely distribution of residual balances--Ft. Shafter distributed semiannually rather than quarterly and Ft. Dix only annually. Failure to properly distribute residual balances can further distort actual labor costs and lessen or even conceal large residual differences applicable to a single quarter.

Labor and equipment charges are not promptly entered

Job order cost accounting system information on labor and equipment charges was often not up to date because input transaction documentation was either not promptly submitted from the shops or not promptly keypunched into the system.

The Army's job order cost accounting system design provides that actual cost transaction data will be entered into the system without delay. To see how long it actually took for labor and equipment cost data to be entered into the system, we performed a statistical sample at each installation visited except Yongsan Garrison. The sample showed it took an average of about 8 days at both Ft. Dix and Ft. Shafter for such transactions to be entered into the system. At Ft. Carson, it took an average of just over 2 days. 1/ Since most management cost reports produced from the system are printed weekly, cost data is often up to 15 days old when it first becomes available for use by management at Ft. Dix and Ft. Shafter.

We also noted examples of longer delays in processing of labor and equipment cost data at installations we visited.

--Our review of over 7,800 labor and equipment charges processed during 12 days at Ft. Shafter showed that about 2,900 represented transactions over a week old, about 600 represented transactions over 30 days old, and 50 represented transactions over 90 days old.

--At Ft. Dix, 1,451 labor hours worked by one employee from January through September 1980 were all entered in September, in the last processing cycle of the fiscal year. In another case, 2-1/2 months of labor charges for three employees were processed at one time.

Because these cost data were not being reviewed, however, we saw little apparent impact from these delays at installations we visited. Until Army facility engineers begin to use and rely on job order cost accounting system data to manage operations, operating personnel will continue to have little incentive for ensuring that cost data are processed promptly.

SYSTEM DESIGN DEFICIENCIES STILL EXIST

When evaluating the design of the Army's automated Facilities Engineer Job Order Cost Accounting System 5 years ago, we foresaw two basic problems which, if not corrected, would adversely affect the accuracy of cost data. Accordingly, when we approved the system design in July 1977, we did so with the understanding that it would be changed to (1) include an automated error suspense file

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1/At Ft. Dix, our sample showed the average number of days taken to process a transaction was 8.04 within a precision of 1.55 days; at Ft. Shafter, the average was 8.41 days within a precision of 2.48 days; and at Ft. Carson, the average was 2.18 days within a precision of 0.39 days. These precision levels are stated at 95-% confidence.

and suspense clearing procedures and (2) account for certain charges being excluded from the accumulation of actual individual job costs. As of March 1982, the Army had still not developed an automated error suspense file and had not implemented procedures to adequately ensure that all actual job costs were being entered into the cost accounting system. As a result, controls over rejected data were inadequate and cost data on many projects were incomplete.

Controls over rejected transactions are inadequate

The Army's job order cost accounting system does not include an automated error suspense file. Such a file should be used in controlling invalid or incomplete transactions which are rejected by the system until the data is corrected and reentered. Instead, manual procedures must be used to control these transactions. Examples follow of problems we found that were associated with trying to manually control and correct rejected transactions.

--Neither Ft. Dix nor Ft. Shafter adequately maintained visibility over rejected data. At Ft. Dix, rejected transactions were "controlled" by reentering the rejected data, still uncorrected, back into the system. This is a very time-consuming procedure and does little to ensure that transactions will be ultimately corrected and reentered. For example, for 7 consecutive months, personnel reentered the same rejected labor charge transactions. Ft. Shafter had no procedures to effectively monitor rejected transactions and could not be sure that they were being corrected and reentered into the system. We found examples of material charges that had been rejected but, over a month later, had still not been corrected or reentered into the system. After we pointed out these problems, Ft. Shafter management established a manual log to track rejected data.

--User guidelines for the job order cost accounting system provide that notice of any rejected data should be returned to the individual or activity originating the transaction and that individual or activity should be held responsible for data correction and resubmission. At both Ft. Dix and Ft. Shafter, however, cost accounting system administrative personnel (such as keypunchers) usually attempted to correct and reenter erroneous data. Not holding the originators of transactions responsible for correcting rejected data gives those individuals or activities little incentive to ensure that the data is initially correct. Further, because individuals attempting to correct the rejected data often did not know what corrections should be made, erroneous "corrections" were made and processed against job orders.

As we pointed out when we conditionally approved the system design in 1977, the use of an automated suspense file is generally

the most effective method of controlling rejected data in an automated system. Under this method, all invalid or incomplete information rejected by the system is automatically incorporated into a suspense file. Items in the automated suspense file continue to be printed until corrected, thereby giving management additional oversight and control.

During our review, Army officials said the system design change that would set up an automated error suspense file had not yet been made, primarily because of the amount of resources needed to develop it. We still believe that an automated error suspense file is an essential feature for controlling rejected data in an automated system and should be adopted by the Army as soon as possible. In the interim, the Army should ensure that effective manual procedures are used at all installations for controlling and correcting rejected data.

Certain actual job costs are not accurately accounted for

When approving the system design, we pointed out that it lacked procedures, either automatic or manual, for accumulating on an individual job order basis, costs for contracts, transportation, travel, civilian awards, utilities, and terminal leave. Our review showed that except for the occasional entering of certain contract cost data, installations visited were still not entering these costs into the job order cost accounting system. For example, at Ft. Dix the cost to paint the interior of a building was estimated at $11,905. Upon completion of the work, however, only $1,360 in actual costs had been recorded against the job order in the cost accounting system. We found that most of the work on the project had been done under a contract to paint several buildings at a total cost of $89,937. No breakdown of costs per building had been made. These contract costs were never charged to the appropriate job order, so management did not know the actual cost to complete the work. Further, although cost accounting reports showed an 89-percent variance between actual and estimated costs for the building, no action had been taken by management to determine the causes of the differences.

At Ft. Carson, some job orders that involved only contract costs were not even being established in the job order cost accounting system. Two such projects were valued at $304,000 and $138,000. Without the inclusion of costs such as these, management is not provided with historical cost data, effective control over resources, or sufficient information to meaningfully analyze costs incurred or to judge efficiency of operations.

The Army should establish effective controls and procedures to ensure that contract, transportation, travel, civilian awards, utilities, and terminal leave costs are properly entered into the cost accounting system.

SYSTEM USERS HAVE NOT BEEN ADEQUATELY TRAINED

The Army has not adequately trained installation managers and personnel to operate and use the Facilities Engineer Job Order Cost Accounting System. System users have received little training since the installation converted to the system--and most of that given has centered around operations rather than effective use of the system's products. As a result of the low emphasis on user training and the high rate of personnel turnover at installations visited, many individuals were involved in the day-to-day operation of the system who had never received any formal training.

For example, at Ft. Dix only 2 of about 25 employees that are, or should be, regularly involved in cost accounting operations have received any formal training on the operation and use of the system. Since conversion to the system in 1976, no one has received formal training on the use of system reports in managing operations. At Ft. Shafter, no formal training was given to managers or operating personnel from June 1977 to February 1979. Also, the Army requires each installation to have a project officer who is responsible for providing training on operation and use of the job order cost accounting system. At Ft. Dix, the project officer position was vacant from July 1980 to December 1981.

The lack of adequate training on operations and use of the system was also pointed out by an outside consultant hired by the Army in 1979. The consultant found that managers and personnel received little training on the use of the system's reports and that personnel lacked an understanding of how the system works. Based on the consultant's findings, the Army established a training course on the use of system reports. However, at the time of our review, the course had been given to only six of the 70 installations operating the system.

System proponents, in this case the Office of the Chief of Engineers, have the responsibility of ensuring that system users (operating personnel as well as managers) receive adequate training. Their failure to do this is one reason why management has made so little use of cost reports and operating personnel are so often unable to properly enter certain types of costs--such as contract costs--into the system.

LENGTHY REPORTS ARE CUMBERSOME AND DISCOURAGE USE

Some of the cost reports now produced by the Army's automated Facilities Engineer Job Order Cost Accounting System are not used because they are too lengthy. Better use of "exception" reports could aid managers' analysis and use of cost data.

For example, the daily Special Projects Report--a sequential listing of job orders with related estimated and actual job costs--would normally be used to identify large project cost variances. However, because the report is so lengthy (approximately 650 pages each day at Ft. Shafter) managers were very reluctant to attempt to use it. In this case, an exception report designed to list only those jobs with significant cost overruns or underrruns would greatly facilitate managers' use of cost data.

Such an exception report can be used to monitor the performance of an organization in any number of areas since it readily signals those items that require management's attention. Unless information is presented in usable length and format, managers will continue to be reluctant to analyze it.

CONCLUSIONS

The continued and widespread ineffective use of the automated Facilities Engineer Job Order Cost Accounting System stems from an overall lack of adequate management emphasis on the importance of such a system in achieving and maintaining efficient and effective maintenance and repair operations. Potential use of the system as a management tool--including the identification and analysis of large variances between estimated and actual project costs--has not been taken advantage of. Operating personnel have had little incentive to ensure that cost data are put into the system accurately and promptly.

We still believe that the system, if implemented and operated according to the design we approved 5 years ago, with the changes the Army agreed to make to the system at that time, would be a good system. However, the system proponents' responsibilities do not end with designing the system. They include making sure that managers and operating personnel are adequately trained to operate the system and use the system's reports. Until facility engineer management begins to utilize the cost data the system provides, particularly in analyzing and explaining significant variances between estimated and actual project costs, inaccurate and untimely data will continue to be produced and no meaningful benefit will be realized from the funds spent to develop the system.

RECOMMENDATIONS

We recommend that the Secretary of Defense have the Secretary of the Army

--direct installation operating personnel to prepare and enter cost information into the system in an accurate, complete, and timely manner;

--revise cost report formats to permit ready use by management and to include more use of management exception reports;

--correct the two system design deficiencies we identified when we approved the system;

--adequately train system users to operate the system and use its reports; and

--make sure through periodic review that managers use the cost data and other information contained in the automated Facilities Engineer Job Order Cost Accounting System to effectively maintain and operate Army facilities.

We further recommend that the Secretary of Defense take these actions before the system is implemented at the remaining installations scheduled for conversion.

AGENCY COMMENTS

Army officials generally agreed with all findings and concurred with the recommendations aimed at improving the operation and use of the system and training system users. Regarding our last recommendation--that all other recommended actions be completed before the system is implemented at additional installations--the Army said it was inclined to agree, but wanted further coordination within the Department before responding.

The Army also felt that we should more clearly specify that the problems discussed in the report were applicable to the automated system approved by the Comptroller General in 1977 and now part of the overall management information system known as the Integrated Facilities System. Many installations still operate manual cost accounting systems. We have revised the report to accommodate this suggestion.

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