Industrial Management Review Of The Army Aeronautical Depot Maintenance Center Corpus Christi, Texas

B-159896

Department of the Army

UNITED STATES
GENERAL ACCOUNTING OFFICE

DEC.17,1973

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

LOGISTICS AND COMMUNICATIONS
DIVISION

B-159896

The Honorable
The Secretary of Defense

Dear Mr. Secretary:

We have reviewed, from an industrial management viewpoint, operations at the U.S. Army Aeronautical Depot Maintenance Center, Corpus Christi, Texas. Our report identifies opportunities for improving both the management of maintenance operations and the productivity of the work force.

In view of the actions taken or planned by the Army, we are making no further recommendations at this time.

We are sending copies of this report to the Director, Office of Management and Budget; the Chairmen, Senate and House Committees on Appropriations, Government Operations, and Armed Services; the Chairman, Subcommittee on Priorities and Economy in Government, Joint Economic Committee; and the Secretary of the Army.

Sincerely yours,

F. J. Shafer

Fred J. Shafer
Director

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Department of the Army B-159896

D I G E S T

WHY THE REVIEW WAS MADE

Industrial management review concepts are useful in determining an organization's efficiency and how it affects the cost of items being produced. These concepts place emphasis on evaluating the organization's total system of operations, management, and cost control and the procedures used to achieve efficiency and economy.

In a February 1971 report, GAO reported to the Congress that these review concepts could be effective in identifying ways to reduce Government contractor costs and that it was feasible for GAO to use such concepts in its audits. GAO has since applied them to Department of Defense in-house depot maintenance facilities. The first such GAO review was at the Naval Air Rework Facility, Alameda, California. A report on that review was issued in July 1973. GAO continued its work in this area at the U.S. Army Aeronautical Depot Maintenance Center, Corpus Christi, Texas.

FINDINGS AND CONCLUSIONS

GAO identified several opportunities for improving the productivity of men, materials, and machines. The opportunities can be converted to maintenance cost savings by strengthening management controls. Although GAO did not fully measure potential savings, they could amount to several million dollars if the depot:

--Converted 14-percent idle time to productive time to allow the depot to absorb additional work without increasing the work force. (See p. 7.)

--Improved its work measurement system and labor standards program to increase productivity. (See ch. 2.)

--Reduced excess quantities of direct materials accumulated in the maintenance shops. (See ch. 3.)

--Increased use of machines, operating at only about 40 percent of the established goals, by releasing unneeded machines to other users and improved machine usage data to aid in managing equipment. (See ch. 4.)

--Systematically made decisions to repair or replace internal parts of items being overhauled. (See ch. 5.)

AGENCY ACTIONS

GAO discussed its findings with top officials at the depot and the Army Aviation Systems Command. They generally agreed that improvements were needed. Depot officials provided written comments, indicating the corrective actions taken and identifying other actions they intend to take. Their comments are presented in each chapter.

Defense stated that, after an appropriate interval, it would inquire as to the effectiveness of actions taken. (See app. III.)

In view of the actions already taken or planned by the Army, GAO is making no further recommendations at this time.

CHAPTER 1

INTRODUCTION

The Aeronautical Depot Maintenance Center, Corpus Christi, Texas, is the Army's only depot maintenance center for helicopters, engines, and related components. The depot is under the direction of the Aviation Systems Command, St. Louis, Missouri. It occupies facilities furnished by the Navy on the Corpus Christi Naval Air Station and has acquired production equipment valued at about $20.4 million. In its fiscal year 1972 repair and overhaul operations, it used $36.4 million worth of material furnished by the command at no cost to the depot. Costs incurred by the depot for fiscal year 1972 and paid through its industrial fund were as follows.

Direct cost:		
Labor	$23,175,000	
Material	48,212,000	
Contractual service	2,513,000	
Other	435,000	$ 74,335,000
Indirect cost:		
Operating overhead	$16,593,000	
Administrative	9,645,000	26,238,000
Total		$100,573,000

The depot's repair process is similar for each end item. The end item is disassembled, worn or broken internal parts are either repaired or replaced with new parts, and then the item is reassembled. Completed end items are tested and returned to operational units or to supply for reissue. Of the total work force of 4,100 employees, about 2,300 work directly on helicopters, engines, and components. The work completed and man-hour averages over the past 3 fiscal years were as follows.

Fiscal year	Work programs: Helicopters Units	Helicopters Man-hour average	Engines Units	Engines Man-hour average	Components Units	Components Man-hour average
1972	666	2,460	4,115	313	43,598	15
1971	548	2,844	4,483	322	48,526	14
1970	491	2,542	5,669	288	47,403	15

We directed this review, conducted from January to September 1972, toward identifying opportunities for improving productivity in the areas of direct labor, materials, machines and equipment and for improving management by applying industrial management review techniques.

CHAPTER 2

DIRECT LABOR

MEASURING WORK

A widely accepted method of measuring a labor force's performance is comparing actual with planned work. The depot uses this method in its work measurement program. Labor standards form the basis for planning the amount of work expected to be done during a specific period. Once the work is accomplished, standard hours are called earned hours. The quotient of earned hours to actual hours forms the rate of effectiveness--a measure of employee productivity. The importance of realistic labor standards for measuring work, therefore, is immediately apparent.

Besides measuring the efficiency and effectiveness of the work force, labor standards are valuable in (1) determining manufacturing costs, (2) planning, scheduling, and controlling men, material, and machines, (3) improving equipment use, and (4) identifying problems needing management attention.

Labor standards indicate the time necessary for an operator to perform a specific task working at a normal pace in a predetermined manner and allowing adequate time for fatigue and personal needs. The depot uses two types of standards: (1) engineered standards, which, through such techniques as methods time measurement and work sampling, measure the time required to perform a task or operation and (2) technical estimates based on estimating methods which do not qualify as engineered standards.

Properly developed engineered standards are generally more accurate than technical estimates and therefore form a better basis for measuring planned versus actual performance, but their development is more expensive. Therefore, they are most applicable to high-volume, highly repetitive tasks or operations in which accrued cost savings generated through developing better methods and standards should more than offset the cost of developing the standards.

Technical estimates are less accurate but less expensive; hence, their use is most appropriate on low-volume tasks or operations.

One technique for testing the adequacy of a work measurement system is through work sampling. When production workers' idle time is more than expected yet the work measurement system shows highly effective production, inflated labor standards are strongly indicated.

GAO WORK-SAMPLING STUDY

To test the depot's work measurement program, we compared the direct labor work force's reported performance, based on labor standards, with observed performance, based on our independent work-sampling study. During a period when the work force's reported performance was 104 percent effective, our 12,093 observations showed workers idle about 20 percent of the time. With effectiveness at 104 percent, we expected a minimum of idle time. The complete study, performed at random intervals over a 10-day period and covering 300 statistically selected direct labor workers, is included in appendix I.

The following table summarizes the observed performance and compares it to expected performance.

	Observed performance		Expected performance	
Productive:				
Direct	45.5%			
Indirect	24.7			
		70.2%		84.4%
Nonproductive:				
Idle	20.5		-	
Personal and other	9.3		15.6%	
		29.8		15.6
Total		100.0		100.0

Idle time was the largest single category of nonproductive work. A worker was classified as idle if he was observed in the work area but not working by his own choice when productive work was available. Since most shops had not established official break times, part of the idle time we observed could have been unscheduled breaks. On the basis of productive time expected by the depot, we estimated that workers were idle at least 14 percent (29.8 percent observed minus depot allowance of 15.6 percent) of the time when they were expected to be productive. This would amount to at least 19,000 hours or $83,000 in idle time during the 2-week study period.

Because of the apparent disparity between the high reported rate of effectiveness and our independent observations showing 14 percent lost productive time, we further examined the depot's labor standards program.

More and better engineered standards needed

Engineered standards were being used for only a small part of the depot's workload and many of those in use were unrealistically high. Developing and applying more standards and refining those already in use is feasible and would improve the work measurement system and the determination of manpower needs, production scheduling, and overall depot productivity.

About 80 percent of the depot's fiscal year 1972 workload was measured with technical estimates and only 20 percent with engineered standards. According to the depot, current and projected workload stability makes approximately 90 percent of the future direct labor hours susceptible to engineered standards. Accordingly, the depot has developed a program to satisfy most of this requirement by July 1974.

Potential benefits of increasing engineered standards coverage becomes more meaningful when it is recognized that technical estimates are generally less accurate and often allow more time than engineered standards for the same tasks. During fiscal year 1972, for example, techical estimates which formerly measured 14 tasks were converted to engineered standards with an average 35-percent reduction in standard time. Scheduling and controlling work on the basis of overstated estimates such as these results in nonproductive time. A systematic conversion to engineered standards in areas of stabilized tasks, therefore, has potential for meaningful improvements in scheduling and control procedures as well as for reducing nonproductive time.

Although the depot's increased emphasis on engineered standards is certainly commendable, improvements are needed in those already in use. For example, we reviewed measurement information for 15 engineered standards and found 11 standards inflated. As of March 31, 1972, production counted for 47,300 units measured by these 15 standards had earned 14,573 hours. Actual hours consumed totaled 13,025, yielding a reported effectiveness rate of 112 percent. If correct standards had been used, however, only 10,578 hours would have been earned--a 27.6-percent reduction in standard time--to yield an effectiveness rate of only 81 percent.

In examining these 15 engineered standards, the most frequent error we observed was the occurrence rate--the number of times a work step is performed--for the individual work elements. For example, one standard allowed 17.9 minutes to check and test a small metal tube used to distribute fluids on a helicopter. The standard, which allowed the time necessary to check and test one tube at a time, was based on the following work steps: Getting tube to work area, walking to tester, pressure testing, walking to degreaser, degreasing tube, returning to workbench, completing paperwork, and disposing of the tested tube. Work measurement documentation, however, showed that these tubes were processed through the work elements in batches of 10, not 1 at a time as allowed by the standard. In this example, the actual occurrence was only 10 percent per tube, rather than 100 percent as allowed by the standard. Changing the element occurrence rate in this standard to 10 percent would reduce the standard performance time of 17.9 minutes by 9.3 minutes per tube, or a 51.9-percent reduction in standard time.

Overstating the occurrence rate for work elements not only inflates the performance effectiveness rate but also encourages inefficient labor use. In the previous example, for instance, the worker could have processed tubes one at a time, as the existing standard provided, but that would have been very inefficient.

Conclusions

While the depot's work measurement system appeared to be conceptually sound, it was not achieving maximum results due to deficiencies in the labor standards program. The depot's labor standards can be significantly improved which in turn, will greatly improve the work measurement system.

DEPOT COMMENTS

Even though depot officials thought our studies were not sufficiently broad to conclusively evaluate the entire depot operation, they agreed that some nonproductive time exceeded that provided for in the standards. They attributed this to a major reorganization and a new production approach, both of which occurred, they said, during the period of our work-sampling studies. They stated, however, that any excessive nonproductive time was unacceptable and that action being taken was expected to dramatically improve the area of nonproductive time.

Depot officials said the inaccuracies we found in our sample of engineered standards pertained primarily to "batching." (Batching is the practice of processing a group of like parts through a standard work element together, rather than processing them one at a time.) Standards in this area will be reviewed and updated on the basis of fiscal year 1973 production schedules.

Depot officials stated that our review of labor standards had stimulated increased interest in the work measurement program and had caused a close scrutiny of goals, accomplishments, and techniques used. This additional emphasis by command, top management, and supervisory personnel will be augmented by a semiannual sampling of engineered standards.

Depot officials stated that the workers must accurately report actual hours and production if the system is to be useful. They felt that the high rate of effectiveness reported by the depot when our work-sampling study showed excess idle time was not a failing of the work measurement system but rather was due to charging idle time as indirect labor. Because detailed reporting requirements were misunderstood, erroneous data found its way into the program, which produced unrealistic effectiveness rates. They said that command personnel were emphasizing the development and implementation of an effective production planning and control procedure, including scheduling more audits to insure proper man-hour and work-unit reporting. These procedures, they said, would be compatible with a new system scheduled to start in July 1973.

We believe expanding and continuously updating engineered standards, together with developing and implementing an effective production planning and control procedure as promised by depot officials, will enable the depot to significantly improve overall industrial operations.

CHAPTER 3

DIRECT MATERIALS

The depot stocks 22,000 different parts. The cost of direct material issued during fiscal year 1972 was about $84.6 million, most of which was for replacement parts used in repairing or overhauling helicopters, engines, and components.

When major components and end items are disassembled, parts which can be repaired are routinely routed through various repair shops and returned to the original point for reassembly. These parts can be determined unsuitable for repair at any time during the repair process. Parts which are unsuitable are replaced by new parts.

To avoid delays in repair programs and to insure adequate parts support, the depot establishes stock levels and replacement rates. Stock levels are intended to preclude oversupply by limiting the quantity of parts on hand, and replacement rates are used to determine procurement and preposition quantities needed to support projected workloads. The replacement rate is the historical or estimated frequency that a part is expected to be replaced during repair or overhaul of an end item.

EXCESS SPARE PARTS ON HAND IN MAINTENANCE SHOPS

Quantities of excess parts had accumulated in the maintenance shops because stock levels and replacement rates had not been supported by inventory information needed for day-to-day material orders and turn-in decisions in the shops. Prompt, accurate information on materials needed and on hand in the maintenance shops would reduce oversupply and related investment in parts stocked for use in depot work. Our conclusion is based on a test of 25 replacement parts of which excess quantities valued at about $400,000 had accumulated.

There are two sources of replacement parts at the depot: (1) the Consolidated Property Division (CPD) has an authorized 90-day stock level of parts to support the depot maintenance shops and (2) the shops are authorized to keep enough parts on hand to complete all ongoing work plus enough additional parts to support a 15-day future workload.

The depot operates under a procedure which provides that excess material be turned in after a program is completed rather than during it. The depot completes about a thousand programs a year and most are active for a full year. Under these procedures, therefore, excesses accumulate over a 1-year period before being turned in. Adjustments to replacement rates for actual parts usage would also be delayed by the once-a-year turn-in.

The only inventory control exercised during the depots' repair programs were occasional unscheduled counts of parts, but these counts were limited to new parts within the maintenance supply activities and did not include parts--new or used--located throughout the repair shops.

To test the depot's program, we counted quantities of 25 replacement parts used on T-53 engines and helicopter main rotor heads. For 22 of the 25 parts, the shops had accumulated excess quantities as shown below.

			Percent
Total units counted		8,771	
Less:			
Parts required for ongoing work	5,969		68.1
Parts required to support 15-day future workload (based on replacement rate)	70	6,039	.8
Total		2,732	31.1
			100.0

The 8,771 units consisted of (1) components repaired by the depot and ready for issue, (2) components removed from larger assemblies and being repaired, (3) components removed from larger assemblies but not routed for repair, and (4) new components ordered on the basis of replacement rates and received from the Consolidated Property Division. As shown above, 31 percent of the parts, valued at about $400,000, exceeded immediate needs and represented a questionable inventory investment.

Depot personnel cited several factors that could cause unneeded parts to accumulate in the shops, such as

--salvaging parts from unserviceable items,

--ordering parts on the basis of overstated replacement rates, and

--ordering at an accelerated rate because of inadequate support.

We agree that each of these factors could cause a build-up of unneeded parts. However, we believe that each could be controlled, if managers know at all times how many parts are on hand in the shops.

For example, the shops had accumulated 69 T-53 engine compressor shafts. Shop personnel, in accordance with approved procedures, had been ordering shafts on the basis of a 15-percent replacement rate and, when we counted them, had 24 more shafts on order. Shop personnel did not know they already had excess shafts on hand when they placed the last order.

DEPOT COMMENTS

Depot officials agreed that savings would be realized by eliminating invalid demands and that replacement rates would be more valid if true consumption data were used. They stated that efforts were being made to control material better, maintain the 15-day level, and turn in the residue of excess material.

We discussed merits of establishing perpetual inventory records in the maintenance area. Depot officials stated that keeping such records would be cumbersome and costly due to the number of personnel required. Further, they noted that Army regulations prohibit inventory stock records in maintenance areas.

Instead of keeping such records, the depot will continue to make unscheduled counts but will include parts throughout the shops in addition to those within maintenance supply activities, as we suggested.

If these additional steps are aggressively carried out on at least a quarterly basis, they should minimize accumulated excesses as well as provide more current and accurate replacement rates and stock levels. We are inclined to agree with the depot's position that keeping inventory records in the maintenance area could be cumbersome and costly.

CHAPTER 4

PRODUCTION EQUIPMENT

Our studies of general-purpose equipment showed an overall 34-percent usage rate. Because many of the depot's machines are identical or can do comparable work, the amount of unused machine capacity suggests that excess machines are on hand. We identified opportunities to reduce the depot's investment in machines, which would also increase the use of remaining machines. Machines not needed at the depot could then be made available for other DOD installations.

Production equipment used in repairing and overhauling helicopters, engines, and components was valued at about $20.4 million. Of this amount, about $6.8 million was for power-driven, nonportable, metal cutting and forming machines costing $1,000 or more each. Of 437 machines, 366, which we called general-purpose equipment, and which represented an investment of about $16 million, were assigned to the maintenance work centers and were the subject of our studies. We did not develop usage data on special-purpose equipment such as holding jigs, fixtures, and test equipment or on general-purpose equipment not assigned to the maintenance work centers.

Complete usage data was not available for equipment management at the depot. In July 1971, the depot began developing a system to collect this data for making decisions concerning maintenance, acquisition, or disposal of equipment. The system was not complete when we began our studies; consequently, acquisition decisions were not based on actual usage. Acquisitions since July 1, 1969, have been based primarily on a 1968 study by the Army Production Equipment Agency.

OBSERVED MACHINE USE

We made two studies on machine usage. The first, a 5-day study started May 8, 1972, included a random sample of 366 general-purpose machines. The second 5-day study, started May 17, 1972, included all general-purpose machines assigned to the depot's machine shop. Findings from both studies are shown in appendix II.

In both studies we observed that machines were idle about 66 percent of the time. The rest of the time the machines were (1) working, (2) being set up to do work, (3) down for maintenance, and (4) running but not working. The machines were working about 17 percent of the time.

Our studies indicate that it may be possible to reduce the machine inventory, especially when duplicate machines are involved. For example, the depot has $1.5 million invested in 58 grinding machines. Assisted by the shop foreman, we identified groups of grinding machines capable of doing the same work. The observed average use rate on these grinders was about 42 percent. Similar conditions exist for milling machines and engine lathes. We believe a number of these machines could be made available to other DOD activities, which could result in better use of remaining machines at the depot.

MACHINE ACQUISITIONS

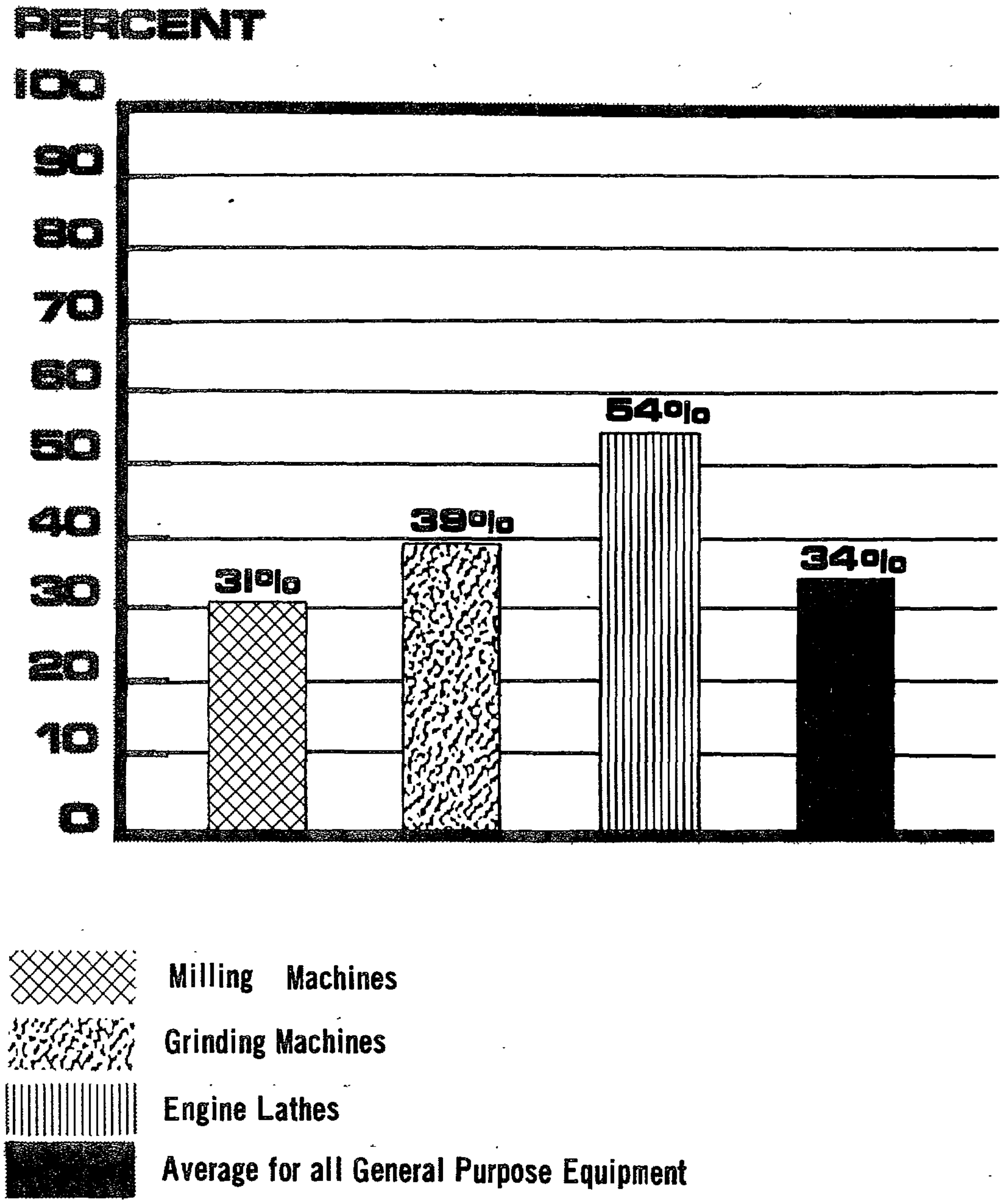
Since July 1, 1969, the depot has acquired production equipment valued at about $1.1 million; the acquisitions were justified on the basis of a 3-week study in 1968 by the Army Production Equipment Agency. This study, rather than current and projected usage and workload data, was being used to justify fiscal year 1972 equipment purchases. Continued use of the 1968 study to justify new equipment needs can result in buying unneeded machines.

A depot system for collecting usage data was underway.

DEPOT COMMENTS

Depot officials advised us that collection of machine usage data had started in May 1972. This action, they said, was in accordance with a long-range plan initiated in July 1971. The depot has established minimum, objective, and maximum usage criteria for each type of equipment for which data is being collected. Usage objectives range from 25 to 99 percent. According to the depot, these rates were based primarily on judgmental decisions made by equipment management personnel.

OBSERVED USE RATES FOR SELECTED MACHINES



Depot officials noted that we made our work-sampling study during the first shift and that we did not consider second shifts in two major shops. The depot expected to convert to a single shift operation in September 1972, which should increase the usage rate for the shift.

Although depot officials did not believe that a "substantial" part of the general-purpose equipment was excess, after reviewing our study results, the depot either removed or placed in administrative storage 14 machines valued at about $200,000. This action, according to depot officials, increased the overall usage rate by about 2 percent. Considering general-purpose equipment as a whole, depot officials said machine use needed to be increased only about 10 percent to meet minimum criteria established by the Army Materiel Command. Further action is being taken to increase use as data is developed through the Equipment Management Utilization Program.

Full implementation of and adherence to this program, we believe, should greatly improve usage data, which in turn should provide a better basis for managing, maintaining, and acquiring equipment.

CHAPTER 5

REPAIRING OR REPLACING PARTS

Disassembly of end items is usually the first step in depot repair. After parts are disassembled and inspected, decisions are made to either repair or replace worn parts. These decisions should consider the costs of repair versus replacement.

Although Army criteria say replacement should be considered when the cost of repair reaches 65 percent of the cost of acquisition, the depot was incurring costs to repair some parts which exceeded the costs of new parts, and it was also repairing parts when excess serviceable parts were available in the supply system.

ECONOMIC REPAIR OF PARTS

The depot had not established procedures for accumulating repair costs or comparing them with replacement costs nor had it assigned responsibility for making decisions to repair or replace parts.

We developed estimated repair costs for 10 parts and found that, for 7, replacement would have been less costly than repair. Examples of four such parts follow.

T-53 engine part	Current replacement cost	Approximate repair cost	Approximate production quantities
Retainer ring	$12.11	$28.63	556
Rear oil ring	14.30	19.86	831
Forward oil ring	10.78	26.13	831
Retainer plate	18.48	24.45	996

The questionable cost in the above examples totaled over $58,000, and the 23,000 direct labor hours consumed could have been used for other work.

REPAIR OF EXCESS PARTS

The Army has established procedures to preclude repair of parts when excess serviceable parts are available. National inventory control points are required to notify the depot to stop repairing items when serviceable stocks are available.

In November 1971 the depot was notified to stop repairing 294 T-53 and T-55 engine parts. The depot stopped repairs until its own stock of serviceable parts was depleted but then resumed repair even though additional excess parts were available through the inventory control point.

According to depot officials, repair was resumed because subsequent notices from the inventory control point omitted these parts from excess listings. Consequently, depot personnel did not know excess parts were still available.

DEPOT COMMENTS

Depot officials concurred that they did not have an adequate system showing the cost of repairing parts of reparable end items. They also agreed that they needed to compare estimated repair costs with the cost of new parts and that they would modify the parts control system to compare repair and replacement costs at certain points. This procedure was to start in March 1973.

As a result of our observations dealing with repairs of excess parts, depot officials stated they would request a review by the Army Aviation Systems Command of existing procedures to avoid repairing unneeded parts.

INDEPENDENT GAO WORK-SAMPLING STUDY

The table below summarizes our observations and projects them for an 8-hour day.

Observation category (note a)	Number of obser-vations	Percent of total	Projection for 8-hour day: Hours	Minutes
Direct productive:				
Craftwork	5,364	44.4	3	33
At attention	134	1.1	-	5
	5,498	45.5	3	38
Indirect productive:				
Job preparation	967	8.0		38
Walking	979	8.1		39
Planning and analysis	838	6.9		33
Other	207	1.7		8
	2,991	24.7	1	58
Nonproductive:				
Idle	2,477	20.5	1	39
Personal	376	3.1		15
Official break	238	2.0		[b] 10
Delays	111	.9		4
Other	402	3.3		16
	3,604	29.8	2	24
Total	12,093	100.0	8	

[a] A full description of each observation category is on the following pages.

[b] Official breaks consist of a 15-minute morning break and a 15-minute afternoon break; however, the majority of shops did not use official breaks. The nonproductive allowance for those shops not using the official break is included in either the "idle" or "personal" observation category.

DEFINITIONS OF OBSERVATION CATEGORIES

Direct productive:	
Craftwork	Direct work on altering or repairing end items. Short movements dealing with material and tool handling are considered craftwork, provided that it is in the immediate work area. Also includes one worker assisting another.
At attention	Time spent watching a machine in process.
Indirect productive:	
Job preparation	All work essential to making ready for craftwork, i.e., obtaining, laying out, and putting away tools. Also includes personal cleanup, i.e., machinist wiping oil from his hands.
Walking, handling material	Walking with or without material on a job-related element.
Planning and analysis	Includes reading blueprints, shop travelers, etc. Also includes getting instructions from supervisor and job-related discussions with coworkers. All administrative details, time cards, etc., are in this category.
Other	Includes all other indirect productive functions that are not included above.
Nonproductive:	
Idle	Worker is idle without a reason and by his own choice when there is productive work available.

Nonproductive (continued):

Personal	Includes time necessary for the personal well-being of the individual. Primarily getting a drink or using the washroom.
Official break	Official rest period.
Delays	Any type of delay inherent in the production process.
Other	All nonproductive time not covered in the above categories, i.e., safety meetings, fire drills, power failure, etc.

APPENDIX II

RESULTS OF EQUIPMENT USE STUDIES

Observation category	Percent of observations: First study	Second study
Doing work	17.7	16.5
Being set up	5.9	9.7
Down for maintenance	2.7	5.0
Running, not working	7.1	2.8
Idle	66.6	66.0
	100.0	100.0

DESCRIPTIVE DATA

Universe of machines	366	126
Sample of machines	121	126
Total observations	2,762	3,150
Machines never in use	31	35
Percent of sample never in use	26	28

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

3 OCT 1973

INSTALLATIONS AND LOGISTICS

Mr. Werner Grosshans
Associate Director
Logistics and Communications Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Grosshans:

This is in reply to your draft report titled "An Industrial Management Review of the Army Aeronautical Depot Maintenance Center, Corpus Christi, Texas," (OSD Case #3681).

We are pleased to note that Army generally agrees with the GAO findings in the above report, and has initiated appropriate actions to correct deficiencies. Your report is of particular interest to this office in our efforts to improve productivity, and we plan after an appropriate interval to inquire as to the efficacy of actions taken.

Your continued interest and assistance in the maintenance management area is most appreciated.

Sincerely,

ARTHUR I. MENDOLIA
Assistant Secretary of Defense
(Installations & Logistics)

PRINCIPAL OFFICIALS OF THE DEPARTMENTS OF DEFENSE AND THE ARMY RESPONSIBLE FOR ADMINISTRATION OF ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office From	Tenure of office To
DEPARTMENT OF DEFENSE		
SECRETARY OF DEFENSE:		
James R. Schlesinger	Apr. 1973	Present
Elliot L. Richardson	Jan. 1969	Apr. 1973
Melvin R. Laird	Jan. 1969	Jan. 1973
Clark M. Clifford	Mar. 1968	Jan. 1969
DEPUTY SECRETARY OF DEFENSE:		
William P. Clements	Jan. 1973	Present
Kenneth Rush	Feb. 1972	Jan. 1973
Vacant	Jan. 1972	Feb. 1972
David Packard	Jan. 1969	Dec. 1971
Paul H. Nitze	July 1967	Jan. 1969
ASSISTANT SECRETARY OF DEFENSE (INSTALLATIONS AND LOGISTICS):		
Arthur I. Mendolia	Apr. 1973	Present
Hugh McCullough (acting)	Feb. 1973	Apr. 1973
Barry J. Shillito	Jan. 1969	Feb. 1973
Thomas D. Morris	Sept. 1967	Jan. 1969
DEPARTMENT OF THE ARMY		
SECRETARY OF THE ARMY:		
Howard Calloway	May 1973	Present
Robert F. Froehlke	July 1971	May 1973
Stanley R. Resor	July 1965	June 1971
UNDER SECRETARY OF THE ARMY:		
Herman R. Staudt	Oct. 1973	Present
Vacant	June 1973	Oct. 1973
Kenneth E. Belieu	Aug. 1971	June 1973
Thaddeus R. Beal	Mar. 1969	July 1971

	Tenure of office From	To
DEPARTMENT OF THE ARMY (continued)		
ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS AND LOGISTICS):		
Vincent P. Huggard (acting)	Apr. 1973	Present
Dudley C. Mecum	Oct. 1971	Apr. 1973
J. Ronald Fox	June 1969	Sept. 1971

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