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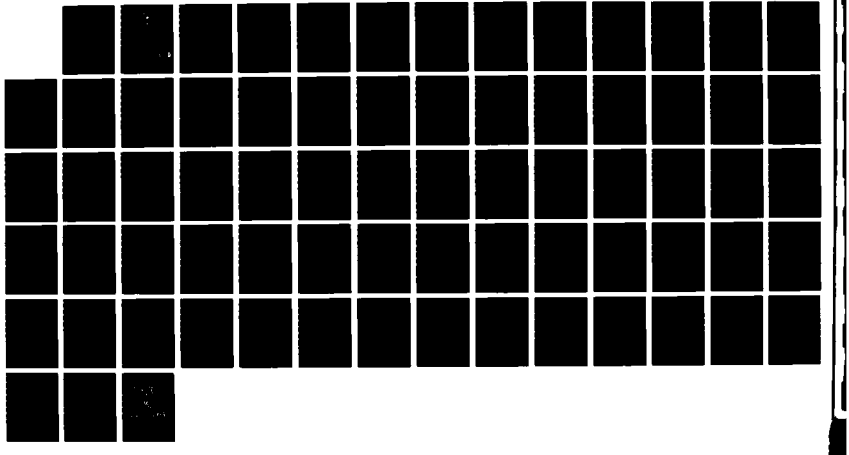

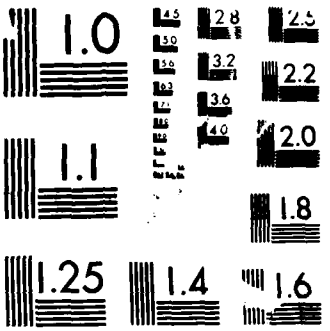

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THESIS

Gordon L. Wells
GM-13

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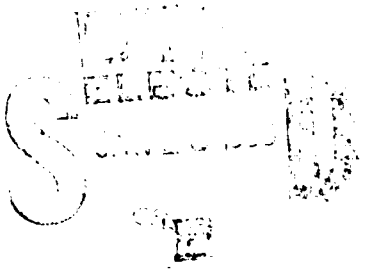

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AN ANALYSIS OF THE COST ACCOUNTING SYSTEM FOR THE DEPOT MAINTENANCE SERVICE, AIR FORCE INDUSTRIAL FUND

THESIS

Presented to the Faculty of the School of Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics

Gordon L. Wells
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September 1987

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Preface

I would like to thank those people who helped me throughout this project. Lt. Col. Jeff Phillips, my thesis advisor, showed great patience throughout my effort and provided a quick turn around of my drafts. I am appreciative of the time and comments provided by the people in depot maintenance at Tinker AFB, Warner Robins AFB, and Wright-Patterson AFB. Their help is what made this effort possible. Finally, I want to thank my wife, Lana, whose patience, typing support, and dining room table made this task possible.

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Abstract

The purpose of this study was to analyze the Air Force Logistic Command Depot Maintenance cost accounting systems from the viewpoint of information provided to managers. The three basic objectives of the study were: (1) Determine how the costing system treated material, labor, and overhead expenses. (2) Identify the cost information the managers had available to aid their decision process. (3) Identify changes to the cost systems which would provide the managers improved information.

The study reviewed the cost accounting systems from three perspectives: the Department of Defense cost requirements, the theoretical cost systems, and the managers viewpoint. The current cost system was analyzed from each of these perspectives.

Recommendations are provided to improve the current cost systems. The study recommends that the following areas of improvement will provide information which will aid the manager in the decision making process: (1) Improve the timeliness of providing information. (2) Develop an actual hour accounting system. (3) Improve the accuracy of direct material charges. (4) Provide management with rework costs. (5) Provide detailed

information on equipment repair and maintenance costs. (6)

Use a standard cost system.

AN ANALYSIS OF THE COST ACCOUNTING SYSTEM FOR THE DEPOT MAINTENANCE SERVICE, AIR FORCE INDUSTRIAL FUND

I. Introduction

Background

The Air Force Logistics Command is responsible for the Air Force's Depot Maintenance operations. The Depot Maintenance activity is funded through the Air Force Industrial Fund. The concept of operation within an Industrial Fund requires that services will be provided to customers at a price based on the cost of providing the service. The Industrial Fund's source of funds to pay for labor, material, and overhead expenses comes from the reimbursement it receives from its customers. This concept of operation is similar to that of a commercial activity. The only difference is that instead of trying to make a profit, Depot Maintenance attempts to achieve a zero profit or loss.

In order to operate as an Industrial Fund, Depot Maintenance uses a cost accounting system to accumulate the costs required to repair assets. The cost accounting requirements for Depot Maintenance are contained in DOD 7220.29-H, "Department of Defense Depot Maintenance and Maintenance Support Cost Accounting and Production Reporting Handbook". The DOD established Depot

Maintenance uniform cost accounting requirements in order to satisfy four objectives. Three of the objectives are to provide information to organizations outside of Depot Maintenance. These three objectives are listed as follows:

1. Capture the cost of weapon systems or items maintained

2. Compare repair costs between depots and contractors

3. Aid identification of workloads for potential interservice workload.

The fourth objective is related to the purpose of this research effort--provide data to managers to improve the use of resources (1:7).

The AFLC Depot Maintenance operations are primarily performed at The Aerospace Guidance & Metrology Center at Newark AFS and at five Air Logistics Centers (ALCs) located at McClellan AFB, Hill AFB, Tinker AFB, Kelly AFB, and Warner Robins AFB. The workload performed at the ALCs covers a wide range of different products and complexity. The ALCs are responsible for repair of products from small components to the repair of complete aircraft or missile weapon systems.

During FY86, the Depot Maintenance operation used over 46 million labor hours to repair, modify, or overhaul 1331 aircraft, 9750 engines/modules, and 1.1 million exchangeable assets. The total sales value of services provided exceeded $2.5 billion (2:3-7, 30). As with any

company of similar size, Depot Maintenance managers need costing systems which provide them information to aid in decisions for the short and long-term operation of the activity.

The management levels which are involved in running the Depot Maintenance operation begin with a HQ AFLC staff which consists of the Deputy Chief of Staff (DCS) for Maintenance, his Deputy, and five directorates (Quality, Resource Management, Systems, Workload, and Engineering). The next level of management starts with the Director of Maintenance at each of the ALCs. A typical ALC is organized into staff divisions (Administrative Services, Plant Management, Quality, and Resources) and production divisions (Aircraft, Engines, and Components). The levels of management within a product division include division branch, section, unit (also known as the Resource Control Center or RCC), and first line supervisor. Thus, the typical ALC has six different levels of management.

The Depot Maintenance data systems were established prior to the FY 1969 implementation of industrial funding. As a result, the systems were originally designed to provide management production information with little concern for the actual cost of repair. In order to provide the costing data required of an Industrial Fund, costing information was originally provided through interfaces with the existing systems.

Specific Problem

Since FY 1969, new data systems have been developed and modifications were made to existing systems to provide improvements to the costing information. Given the background of the current costing systems, a question exists as to how well the costing systems provide the information required by all levels of managers to make short and long-term decisions. In addition, Depot Maintenance management is responsible for the repair of a diverse group of assets--each of which can require different types of cost information. Also, each level of management (six at the ALCs plus the HQ AFLC staff) requires a different level of detail to perform their management function.

Justification

There have not been any studies to date which review the current cost systems from the standpoint of what the managers at different levels and in different product divisions need from the cost systems. The studies which have been performed on Depot Maintenance cost systems have been performed to review the cost information provided to external organizations and to review compliance with external reporting requirements.

Further, the primary design efforts and improvements to the cost systems have been oriented towards satisfying external reporting requirements. The presentation of cost

information to upper-level ALC managers, HQ AFLC, and Air staff is made primarily through financial statements (income statement and balance sheet). Thus, many of the cost system changes are made to improve the financial statement presentation of the data.

Research Objective

The objective of this study is to determine how well the current cost systems provide Depot Maintenance managers the information they need to aid the decision making process. The study includes managers from the Deputy Chief of Staff for Depot Maintenance at HQ AFLC to first level supervisors in production shops. Specific research questions to be answered are:

1. How are material, labor, and overhead expenses treated in the costing system?

2. What type of cost information is available to aid low, medium, and high-level managers in their decision making?

3. What changes can be made to improve the type/amount of cost information provided to the managers?

Scope

This research effort will be limited to managers within the AFLC Depot Maintenance Activity. It will not be concerned with management requirements of any other

functions of AFLC, nor will it be concerned with the management requirements of higher headquarters.

The effort will not limit itself to the capabilities of existing data systems or to the procedures which currently exist for data input to current systems. It will attempt to decide what information is required and then will provide procedures or recommendations to obtain the required information.

Summary

This chapter has established background and the requirement for this research effort. The next chapter contains a literature review which describes the types of costing techniques used in private industry, the requirements for DOD costing systems, and previous research efforts which include a description of the AFLC Depot Maintenance Costing System. The methodology for the research effort is described in Chapter III. Chapter V, Results and Analysis, analyzes the cost system from a theoretical basis, in relation to the type of work performed in depot maintenance, and from the viewpoint of Depot Maintenance managers in terms of their requirements for cost information. Chapter V provides the conclusions of the research effort and provides recommendations for further study.

II. Literature Review

Overview

This chapter contains three sections. The first section provides a review of literature which discusses the general use of cost accounting information for management purposes and the type of costing systems which are generally used by private industry. The second section describes the DOD cost accounting requirements for depot maintenance operations. The third section describes the current cost accounting system used within the AFLC Depot Maintenance.

Management Use of Cost Accounting and Types of Cost Accounting Systems

There are many textbooks and many articles which have been written on the topics of management accounting and types of cost accounting systems. This literature review is limited to only one cost accounting text. The information reviewed provides a simple review of why management accounting is needed and a review of the types of costing techniques which are available for managers.

Management accounting can be described in terms of providing "special-purpose financial reports to managers and other persons inside the organization". The key distinction then is related to the idea that even though

financial statements are provided to external activities, the organization's managers require reports which aid them in performing their management function. These management reports should provide information which is useful in aiding the decision-maker in those areas over which they have control. Important to the concept of management accounting is the idea that since the information is not required by law, it should only be prepared if it is actually useful to management. Management accounting reports are generally based on the idea that they will aid the decision process for further operations. Management reports should provide information which is specific and relevant to the decision process. The information required is not subject to outside influence and thus can be very subjective (7:2).

The types of costing systems which were reviewed include job-order costing, process costing, variable or direct costing, and standard costing. Each of these cost methods considers such costs as direct material, direct labor, and factory overhead in determining the product costs. General and administrative expenses are not part of product costs.

The concept of a job-order cost system revolves around the idea that costs are assigned to specific identifiable batches of work or to specific identifiable projects. The basic idea involves assigning the costs of production to

specific job-orders. This requires that costs which can be specifically identified to the job (i.e. direct labor and direct material) are costed to the job and other costs (factory overhead costs) which are indirectly related to production are allocated to the jobs. There are two different methods for allocating factory overhead costs - the actual cost system assigns costs based on the actual factory overhead incurred during the month while the normal cost system uses a predetermined overhead rate based on estimated expenses to be incurred during the year. Costs are assigned to a work-in-process account until the job is completed; then the costs become part of finished goods inventory. The level at which overhead costs are applied can be done at any level - shop, production department, or plant-wide 7:55-78).

Process cost systems are used if there is a single product which is produced on a continuous basis with all units requiring the same steps for production. The concept is based on the idea that costs are assigned to the department and are allocated based on the number of units produced for a specified time period. The units produced are based on the idea of equivalent units - for example if one unit is one-half completed during the period, it counts as one-half a unit for cost assignment purposes. Two separate costing techniques are based on whether a weight-average or first-in, first-out (FIFO) technique is used.

For the weighted average, costs are spread based on equivalent units in process. The FIFO method requires a distinction between beginning inventories and costs, and current effort and costs. A distinction is made also for the costing of spoilage costs. If spoilage costs are expected and are normal, they can be assigned to the product cost. If the costs are abnormal or unexpected, then costs will generally be assigned to a loss account (not product cost) (7:102-124).

Variable or direct costing operates under the concept that the only costs assigned to products will be direct costs (material and labor) plus the portion of factory overhead which varies with production volume. Fixed overhead expenses are not assigned to the product, but are treated as period costs. This cost concept differs from absorption costing (used in job-order and process costing) by the treatment of the fixed factory overhead expenses. The argument for variable costing is based on the idea that managers in the short run can only affect variable costs, the fixed costs are already locked-in (7:343).

Standard costing operates under the premise that recordkeeping is simplified by the transfer of inventory at a standard cost. If the standard costs approximate actual costs, then the cost data can be used for external reporting systems. If there are differences between standard and actual, then it may be necessary to prorate

variances. Standard systems can use either job-order or normal costing methods. A key feature of standard costing involves the computation and analysis of variances between standard and actual costs. Variances are prorated to inventory accounts and cost of goods sold (7:588-613).

DOD Cost Accounting Requirements

DOD 7220.29-H, "Department of Defense Depot Maintenance Support Cost Accounting and Production Reporting Handbook" provides the guidance for uniform cost accounting for all depot maintenance activities in DOD. Implementation of the handbook was directed to begin with FY 1977.

The handbook directs the use of a job order cost accounting system. The following special criteria is directed for the establishment of job orders:

1. Units subject to analysis or examination before work is performed:

a. A separate job order is required for each unit expected to exceed $60,000 in cost.

b. A separate monthly job order is required for units having the same identification number and which have an estimated repair cost of $10,000 to $60,000 per unit.

c. Quarterly job orders are required for units having the same identification number and which have a repair cost of less than $10,000.

2. Units which do not require analysis or examination before work is performed:

a. A monthly job order is required for units with the same identification number when the expected unit repair cost exceeds $10,000.

b. A quarterly job order is required for units with the same identification number if the expected unit repair cost is less than $10,000 and the total repair work during the quarter exceeds $250,000.

c. A quarterly group job order can be established for similar items when the unit repair cost is less than $10,000, no individual identification number planned work exceeds $250,000, and the total group of assets to be repaired does not exceed $500,000 (3:310-1).

Civilian Labor costs are computed using current pay rates plus benefits. Military labor costs are treated as unfunded costs (not charged to DOD customers) and are computed based on the rates provided in DOD 7220.9-H. Direct labor should be charged at an hourly rate based on the number hours worked on a job-order. Average hourly rates can be used for a cost center when the range of actual pay rates is limited. Allocations of hours worked or job orders can be made for a work center based on standard hours (engineered standards) times the actual labor efficiency of the work center if the allocations are made for short time periods to similar jobs and the allocation is close to the actual labor hours on the job. Indirect labor costs will be assigned to the cost center in

which they work and not directly to specific job orders (3:320-1 to 320-8).

Material which is consumed in the process or which becomes part of the end item is charged to the job-order. Small items of insignificant value may be treated as indirect material. Indirect materials are charged to the cost center. Exchangeable assets used in the repair process are not paid for by depot maintenance, but are treated as direct, unfunded costs at a rate equal to the average cost to repair. Material returns should be credited to the job originally charged against if at all practical. If not practical, then the lowest level of indirect cost will be changed. If no identification is practical, then the return will be charged to general and administrative (G&A) expenses. Material returned but for which no credit is given, will normally be changed to G&A unless it can be identified to a specific job order and the customer specifications are what caused the material to be ordered. Then the cost will be charged to a separate job order for reimbursement by the customer - not to the original job order (3330-1 to 330-3).

Other direct costs (purchased services, travel, per diem, and permanent change of station) will be charged to the job order which caused the costs to be incurred (3:340-1).

Indirect costs are all costs which are not charged directly to a job order. These costs are accumulated by cost element and by cost center. Indirect costs are allocated to job orders through an operations overhead rate and a G&A rate. The costs of indirect departments or service centers will be done prior to the establishment of operations overhead or G&A rates. An operations overhead rate will be developed in each direct cost center and allocated based on direct labor hours. G&A expenses are allocated to job orders based on the total costs assigned to job orders. Provisional overhead rates are established based on the total estimated to be incurred during the fiscal year. Provisional rates can be adjusted during the year. If the over/under absorbed overhead exceeds one percent of actual overhead costs, then assign the costs to job orders. If it is less than one percent, the costs are closed directly to accumulated operating results (3:350-1 to 350-3).

Section 360 of the handbook discusses costs which require special attention. No detail on these costs will be provided. The categories of costs covered include quality assurance, reclamation, rob backs, cannibalization, calibration, modification, programing of equipment, machine tool set-up, defective work and spoilage, sale of scrap, unutilized/under utilized plant, cancelled/reduced orders, training, technical assistance, manufacture, nonmaintenance

work, concurrent maintenance, base support, monetary awards to employees, depreciation, transportation and installation costs of equipment, and removal/disposal of fixed assets (3:360-1 to 360-9).

Current Cost Accounting System

Four recent research efforts reviewed various aspects of Depot Maintenance Accounting Systems at McClellan AFB, Hill AFB, and Kelly AFB. These studies were performed for purposes which are outside of the scope of this research effort, but together they serve to identify characteristics of the cost systems used with AFLC. A brief summary of the objectives of these research efforts follows:

1. Work was performed at McClellan AFB to "examine the recording and reporting of depot level maintenance costs to the office of the Assistant Secretary of Defense for Manpower Installations and Logistics (DASD, MI&L) and the interpretation of the costs in the DASD report RCS DD-M(A) 1397" (4:3).

2. Information obtained from McClellan AFB and the Naval Air Rework Facility at North Island in San Diego, California was used "to document and examine the coding processes used by depots in accumulating cost data reported to the Office of the Assistant Secretary of Defense for Manpower, Installations, and Logistics (DASD, MI&L)" (5:3).

3. A study conducted at Hill AFB and North Island was performed "to document and evaluate the comparability of

overhead costs reported for depot level maintenance at Naval Air Rework Facilities and Air Force Air Logistics Centers" (9:3).

4. The research effort performed at Kelly AFB was designed "to evaluate the capability of the Uniform Cost Accounting System as defined in Department of Defense Instruction (Sic) 7220.29-H to fully capture depot level repair costs (8:3).

Any discussion of depot maintenance cost systems within AFLC should start with an idea of the complexity of data systems. AFLC uses 31 data systems to gather data at the ALCs. These data systems can be identified in terms of functions as follows: four requirement systems, three material systems, seven production systems, seven cost systems, and ten other systems (4:25).

The basic costing method used at the ALCs requires that costs are accumulated at the responsibility cost center (RCC). RCCs are established for all indirect (staff type organizations) and direct (production) organizations. The RCC costs are then assigned to the job orders worked based on a standard hour system (9:51-52). General cost procedures for labor, material, and overhead are as follows:

Direct labor costs are assigned based on standard hours assigned to each job, production for the period, and labor efficiency for the production RCC. The process works

by dividing the earned hours of production (standard hours) into the actual direct labor hours recorded for the period to obtain a direct labor efficiency. This efficiency is multiplied times the earned standard hours for each job order and then multiplied by the RCC labor rate to obtain the direct labor cost for the job order. The RCC labor rate is based on the average actual labor costs times acceleration factors (9:54-55).

Indirect labor costs of the production RCC are allocated in a manner similar to the direct labor costs. Labor costs from non-production RCCs are assigned based on the actual direct hours used in the production RCCs (9:55).

Direct material costs are assigned to a job order when issued from inventory. The material unit price is based on the current stock list price. Indirect materials are charged to the RCC and are allocated based on actual labor hours. Price changes (stock list price) which occur before material is issued to an RCC are treated as a G&A expense (9:55-56).

Production overhead and G&A costs are assigned to production RCCs based on actual labor hours (9:56-58).

The accounting systems keep track of unfunded and funded costs for all categories of expenses. Unfunded costs are those costs which are not paid through the Industrial Fund. Both cost categories are recorded against specific job orders. Examples of unfunded costs include

military labor, exchangeable assets used in the repair process, and base support functions not reimbursed by the Industrial Fund (5:31-35).

As earned hours are recorded against job orders, the costs assigned to the job are recorded in work-in-process (WIP). If no earned hours are recorded then costs are held in a suspense account until hours are recorded (i.e. material costs before production starts). The costs will remain in WIP until all units of the job order are completed. At completion the job costs are recorded as costs of goods sold and the revenues for the job are also recorded (8:45).

Summary

This chapter provided an overview of management use of costing information. It also introduced three levels of costing systems as they might be applied to depot maintenance: theoretical systems, DOD requirements, and the current cost system. This information will be useful in establishing a base of data to be used in Chapter IV, Results and Analysis.

III. Methodology

This chapter describes the methodology used to satisfy the research objective and to answer the research questions. It also describes the population and sample from which data were obtained, the basic interview questions used to generate the data, and how the data were analyzed.

Data Collection Techniques

The primary method used for data collection was personal unstructured interviews with depot maintenance managers. The advantage in using unstructured interviews was that it provided a flexible and open atmosphere (7:481). The interviewees were allowed to provide observations on the costing systems which applied to the level of management and the functional area in which they worked. This was important because AFLC's Depot Maintenance activity includes a diverse workload and has six different levels of management at each Air Logistic Center ALC). Each type of workload and each level of management has different information requirements and different interfaces with the costing systems.

A secondary source of information consisted of a review of the DOD requirements for depot maintenance costing systems and of the general types of costing techniques

which are used in the industrial community. This review was limited to a review of the "Department of Defense Depot Maintenance and Maintenance Support Cost Accounting and Production Reporting Handbook" (DOD 7220.29H) and one cost accounting text.

Population and Sample

The population from which the sample interviews were selected consisted of all managers who work for an AFLC Depot Maintenance organization. From a practical standpoint the sample of interviewees was limited to personnel located at Tinker AFB, Warner-Robins AFB, and HQ AFLC. The Tinker and Warner-Robins locations were selected because they were representative of the workload performed within depot maintenance and because previous research efforts had already been performed at the three other large depot maintenance activities. HQ AFLC interviews provided a headquarters perspective on costing systems. The interviews at Tinker and Warner-Robins were performed during one week visits to each of the locations. The selection of interviewees was based primarily on the availability of individuals during the period of the visit. A balance of managers between functional areas and at different levels was achieved. A total of 82 managers were interviewed. Ten of the managers were from HQ AFLC while 72 were from the ALCs. A breakdown of managers and their

functional and organization level are shown in Tables 1 and 2. Table 1 indicates the management level of the

Table 1

Management Level of Interviewee

Level	Explanation	Qty
I	Director or DCS/Maintenance	3
II	Division	19
III	Branch	21
IV	Section	18
V	Resource Control Center	15
VI	First Line Supervisor	6
TOTAL		82

Table 2

Functional Area

Interviewee Functional Area	Qty
Director or DCS/Maintenance	3
Product Division-Direct	38
Product Division-Staff	19
Quality Assurance	8
Equipment/Facilities	8
Financial	4
Workload	2
TOTAL	82

interviewee - level I represents the Director or Deputy Chief of Staff (DCS)/Maintenance level while level VI is the first line supervisor on the shop floor. Table 2 provides information on the functional organization to which the manager is assigned.

Interview Process

There were two objectives achieved through the personnel interviews. The first objective was to obtain information on the environment within which the depot maintenance manager operates. The second objective was to learn specific data on how the cost accounting system operates.

In order to achieve these objectives, the interview was performed by starting with a few questions on the manager's functional role and the use of costing information in the performance of their jobs. The role of the environment was important because any comments on the costing systems require knowledge of the work environment. The use of costing information was important for two reasons - to understand how well current data satisfied the managers' requirements and to determine if improvements could be obtained in the information gathered.

The managers were specifically queried on their use of information concerning the consumption of material and labor resources. They were also provided an opportunity to

comment on any inadequacies in the current system and to provide recommendations on improving the information provided by the costing systems. The level of detailed questions depended on the manager's functional area and their management level in the organization.

Data Analysis

The data obtained from interviews, previous research efforts, DOD costing requirements, and theoretical costing methods were analyzed from three different aspects. The first aspect of concern was how well the system complies with DOD requirements and also how does the system operate. The second review was concerned with how well the current costing system compares with theoretical or industry costing procedures. The third analysis addressed managers' concerns over the quality of information and the need for additional information.

First, the current costing systems were compared with the requirements published in DOD 7220.29-H. Each requirement from the handbook was compared to the way that the depot maintenance costing system operates. The effort was used to identify those areas in which there were differences and to describe the current system operation.

Second, the current depot maintenance cost system was described so that a comparison could be made with theoretical systems. This information was available from previous research efforts and from interviews. Once the

current system was described then a comparison with theoretical systems was made.

Th last area of analysis was performed by reviewing recommendations provided through interviews for potential improvements to the costing systems. As appropriate, the pros and cons of the improvements were analyzed in terms of practicality, theoretical and DOD costing requirements, and the depot maintenance environment.

Analysis and Discussion

Overview

This chapter discusses the AFLC Depot Maintenance costing systems from three different viewpoints. The first section compares the costing systems with the DOD requirements for depot maintenance costing. The second section compares the costing systems with theoretical costing systems. The last viewpoint considers the use of current cost data and some possible improvements to the costing systems as proposed by depot maintenance managers. These proposals will be evaluated from theoretical, DOD requirements, and the practicality of implementation.

Comparison with DOD Requirements

This section serves two purposes. It satisfies research question number one on how the system treats material, labor, and overhead expenses and it establishes how well AFLC is complying with the DOD requirements. This section is organized with a statement of the DOD requirement followed by a description of whether AFLC complies with the requirement or an explanation of how AFLC differs. Each DOD requirement will indicate the paragraph number in DOD 7220.29-H which applies.

Job Orders - Section 310

DOD requires that a job order cost accounting system will be used to account for depot maintenance costs. The job order system will assign all costs to specific job orders. Job orders are established based on specific criteria established by DOD. For jobs subject to analysis or evaluation prior to work beginning, separate job orders will be established for each unit if estimated repair exceeds $60,000, for each month if estimated unit repair is between $10,000 and $60,000, and for each quarter if estimated unit repair is less than $10,000. For jobs which do not require analysis or examination prior to work beginning, a separate monthly job order is required if unit costs exceed $10,000, a quarterly job order is required if unit cost is less than $10,000 and the total quarterly scheduled inductions exceeds $250,000, and quarterly job orders are established for homogeneous groups of items if unit costs are less than $10,000 and the quarterly total is less than $500,000 when no individual stock number exceeds $250,000.

AFLC complies with the DOD job order costing system requirements. There are two general types of job orders used in depot maintenance. AFLC uses permanent control numbers for programmed workload and temporary numbers for unprogrammed workload.

Costing Labor - Section 320

Civilian labor hours are costed at current pay rates plus an acceleration factor for leave and fringe benefits. Average labor rates for individual costs centers can be used if the range of pay rates is limited so that only minimal distortion of costs will occur. All direct labor hours and costs should be charged directly to the job order worked. Allocation of hours worked on job orders is allowed if the allocation is based on engineered labor standards and the cost center efficiency. Allocations should only be used for short periods of time, when the workload is homogeneous, and the actual hours are close to the allocation hours. Cost centers with diverse workloads and/or workforce should not allocate direct labor hours. Military labor hours are charged to jobs as unfunded costs. Unfunded costs are not included in sales rates to DOD customers, but are charged to all other customers. Indirect labor costs are charged to the cost center worked; they will be allocated in accordance with section 350 on indirect costs. Premium costs (overtime, shift, and hazardous pay) are charged as direct labor only if the job worked is specifically responsible for the costs.

AFLC generally complies with DOD labor costing requirements except that actual direct labor hours are not charged to job orders. Instead, an allocation of hours is made based on the standards established for the job orders

and the labor efficiency of the cost center for the month. For example, if a given work center worked two jobs during a month and the work center efficiency rate was 90%, then for each job the number of hours earned would be divided by .90 to determine how many hours to charge to each job. The number of hours would then be multiplied by the center hourly rate to obtain the total monthly direct labor cost charged to the individual job orders. This allocation method would be in compliance with DOD requirements if all standards were engineered and if the work center and/or workforce is homogeneous.

Material Costs - Section 330

DOD requires that material will be accounted for in a balance sheet inventory account until issued. If the issue is for direct material, then the job order will be charged at the current catalog cost of the material. Indirect material issues will be charged to the cost center. Direct material is material which is specifically required to perform maintenance and will either become part of the end item or will be consumed in the repair process. Small, low cost items can be treated as indirect material. All other material which is not direct will be charged as indirect material. Customer furnished material will be treated as an unfunded cost. Unused material returned to inventory will be credited, if possible, to the original job order. Otherwise materials will be credited to the lowest level

practical of indirect costs. Excess materials returned to supply may or may not be reimbursed. If reimbursement is obtained, the debit is to cash and credit to intra-DOD accounts receivable. If a credit is not granted, then for material not identified to a specific job, charge the G&A expenses. If the material is attributed to a specific job order and it is determined a customer is at fault, then charge the customer on a separate job order. If depot maintenance is responsible, then charge G&A expenses. Reparable exchangeable assets required in repair will be charged at the average repair costs - missing exchangeables will be charged at a standard catalog price.

AFLC follows the DOD material costing requirements. One area of interest is the exchangeable material costing. Exchangeable assets required in the repair process are provided free of charge. These assets are treated as unfunded material.

Other Direct Costs - Section 340

Costs other than material and labor can be treated as direct costs if the costs can be directly attributed to a specific job order. Examples of such costs are purchased services and civilian/military per diem and permanent change of station.

AFLC follows the other direct cost procedures. These costs are only a small portion of total costs and are not applicable for most workloads.

Indirect Costs - Section 350

All costs which are not charged direct to a job order are indirect costs. These costs should be accumulated by type of cost and should be recorded against the organization which incurred the cost.

An operations overhead rate and a G&A rate are established so that the costs can be charged to job orders. Operation overhead rates are established for each direct cost center. The overhead costs are allocated based on the direct labor hours used on each job order. G&A expenses will be allocated to job orders based on the total direct and indirect costs charged to the job orders. Indirect departments and/or service center costs will be charged to benefitting direct cost centers prior to the establishment of operations overhead and G&A rates. The base chosen will cause the costs to be distributed in proportion to the benefits received. Overhead rates should be established annually based on the estimated costs expected to be incurred. An over/under absorbed overhead account should be used to record differences between applied and actual costs. Over/under applied costs which exceed one percent at year end will be applied to job orders; otherwise close the account to accumulated operating results.

The AFLC treatment of operations overhead and G&A expense differs from DOD procedures in two ways. DOD requires the base for spreading indirect expenses to be the

actual direct labor hours incurred on job orders. Since AFLC does not have an actual hour accounting system, the direct labor hours allocated to the job orders are used as the base. Also, AFLC does not use annual overhead rates; the actual overhead expenses incurred during the month are allocated to the job orders worked that month.

Costs Requiring Special Attention - Section 360

DOD has identified 22 cost categories which require special attention. Only those categories that AFLC is not in compliance with will be discussed. Each cost discussed will show the appropriate paragraph reference in parenthesis.

Defective Work and Spoilage (36009)

When the cost to correct defective or the cost of spoilage exceeds a normal level, then these costs should be charged to an indirect expense account. AFLC has procedures to capture costs in this required manner; however, the procedures are usually ignored and the costs are buried in direct labor and direct material.

Initial Installation and Transportation Costs of Plant Equipment (36021)

DOD requires the cost of transportation and initial installation of equipment to be capitalized as part of the total cost of the equipment. AFLC generally complies with this requirement if the work is performed by non-maintenance personnel. If maintenance uses its own

personnel for installation, then the costs will be recorded as an indirect expense.

Removal and Disposal of Fixed Assets (36022)

Costs incurred for removal and disposal of fixed assets should be charged to the accumulated depreciation account. AFLC does not capture these costs when maintenance personnel perform the work. The costs will be buried as indirect labor and indirect material.

Comparison with Theoretical Costing Systems

AFLC Depot Maintenance uses a job order costing system as directed by DOD 7220.29-H. The job order system directed by DOD and as implemented by AFLC differs in three instances from ordinary job order systems.

The first difference concerns the treatment of G&A expenses. A job order system usually treats G&A expenses as expenses unrelated to production. These expenses are not assigned to a job order but are treated as expenses for the period on the financial statements. The G&A expenses do not become part of work-in-process (WIP), finished goods inventory, or cost of goods sold. In contrast, the cost system developed by DOD requires that all costs will be recorded as product costs. This means that all costs will be recorded as a balance sheet asset while work is in progress and will be recorded on the income statement as cost of goods sold.

The second difference is that AFLC does not use actual hours in assigning direct labor costs to job orders. Further, depot maintenance uses an average hourly rate per work center. Included in the hourly rate are amounts for leave and fringe benefits. Job order systems usually assign direct labor costs as the actual hours worked times the employee's hourly rate. Fringe benefits and leave would not be charged as direct labor but would be part of production overhead for direct workers.

The third different area is the artificial criteria used by DOD to establish job orders. DOD arbitrarily uses dollar values to limit the size of job orders. Normally job orders would be established based on the size of an order or based on a practical lot size. The lot size should be more a factor of processes and/or resource limitations than arbitrary dollar amounts.

A job order system works very well in DOD for depot maintenance operations. However, AFLC depot maintenance includes workloads which might benefit from other cost treatments. The engine workload and some component repair operations might benefit from the use of a process cost system. Characteristics of workload which might use process systems include products which are produced on a continuous basis and which receive identical attention. The AFLC engine overhaul process and component repair lines

which are operated continually would satisfy these basic criteria.

A process cost system differs from job order costing in that costs are assigned to a work center and averaged over the units produced for a period of time. A key to process costing is the recording of units produced for a period of time. The units worked are based on the percent accomplished of a complete unit for a given time period. The total amount of work for a period is converted to equivalent units. The Equivalent units are divided into the total product cost to arrive at a cost per unit. Several different averaging techniques are available in process costing - weighted averages, first-in first-out, or last-in last-out. In addition, the cost of defective units can be treated in two different manners - as a product cost or as a loss.

Another costing technique which could prove beneficial for internal management purposes is the direct or variable costing system. Basically, this system treats as product costs only direct labor, direct material, and variable overhead costs. All other costs are considered period costs and go straight to the income statement without becoming part of the cost of goods sold. The non-product costs also are not recorded as inventory on the balance sheet (WIP or finished goods). This cost technique directs

management attention towards those costs which are directly attributable to the production process.

A standard cost system can be used with either a job order, process cost, or variable cost system. A standard system operates under the concept that the products should be costed based on the normal cost of production. The premise of standard costing allows product costs to be carried in WIP and finished goods at a standard cost and to be recorded as cost of goods sold at the standard rate. An advantage of standards is that it compares actual costs with the standards and the difference (variance) can then be analyzed to determine what happened. Variance analysis is performed on both the price and quantity differences between standard and actual. A standard system can direct management attention to those areas which need attention. In the AFLC Depot Maintenance operation, a modification of standard accounting is used for direct labor accounting. The application, though, applies to all jobs worked in a work center during the month. The standard hours required to perform the work are compared to actual hours to obtain a labor efficiency percentage. Each work center has an efficiency goal against which they are measured. As long as the goal is met, then no management action is required, but if efficiency is low, then an explanation is required to determine why the goal was not met.

Another use of standards by depot maintenance involves the method used to develop sales rates. AFLC uses standards to establish the sales rates charged to its customers. Since all costs with the depot costing system are included as product costs, each period's profit/loss is in effect a variance of the standard (sales price) versus actual cost (cost of goods sold). Profit and loss is used as a measure of how well product divisions at the ALCs are performing as compared to their planned operations.

Current Use of Costing Data

This analysis of the use of cost data starts with the use of data by the ALC Director of Maintenance and HQ AFLC management. The primary data used by these levels is based on a comparison of monthly income statements with monthly ALC targets. The process begins with the establishment of monthly targets for expenses, revenues, and profit/loss. These targets are compared with the monthly income statements and variances which exceed established criteria must be explained. Each ALC explains its variances to the ALC Director of Maintenance. The ALC explanations are provided to HQ AFLC/MAJA where a consolidated briefing of the entire depot maintenance operation is prepared for the DCS/Maintenance. The categories of expenses included in the analysis are labor (direct and indirect), material (direct and indirect), and other expenses. Revenue

variances are provided for each major category of workload (aircraft, missiles, engines, exchangeables, and other).

At the ALC level, a similar type of review can be performed at different levels for the product division down to the RCC level. Different ALCs provide a different level of review depending on the level that upper management at the ALC emphasizes for this type of financial review.

For labor expenses, the ALC managers use the data provided by the labor cost system. Within the product divisions, the primary concern is the direct labor efficiency percentage. This computation is available down to the RCC level and represents a ratio of the standard hours required to perform the work in the RCC divided by the actual labor hours used to perform the work. The labor efficiency is compared with the RCC goal and explanations are required for goals which are not reached. The labor system also provides breakouts on indirect labor hours in order to analyze the use of production overhead, G&A, leave, and overtime. These categories of labor are compared with organizational targets and analysis is performed when targets are not achieved. An example of the use of this type information is the Warner-Robins program to reduce sick leave usage. They analyze the use of sick leave by organization and individual. If leave appears excessive, then steps are taken to prevent abuse.

Another indicator used to analyze labor is called output per man-day. This indicator is based on the idea that all labor used by an ALC should be included in the computation of efficiency. The computation involves comparing the ALC production with the total number of hours used for all classes of labor. The concept requires the ALC managers to manage both direct and indirect or overhead functions.

Material expenses are also broken out into direct and indirect categories. Direct material can be analyzed down to the actual job orders. Each job order has a bill of material which represents the standard quantity of materials required to accomplish repair or overhaul. The standard can be compared to the actual material charged to job orders. The analysis of direct material can be accomplished at each level within the product divisions. Indirect materials are charged to the organization requiring the material. The material usage is compared to targeted amounts and any variance is analyzed. The indirect materials are either those consumed in production or they are a G&A expense.

Other expenses are collected at different levels within the ALC. The majority of the other expenses are collected at the ALC level and allocated down to the job level. These expenses are analyzed at the gross level. Each category of expense has monthly targets which are compared

to actual expenses. The variances between actual and target are analyzed in order to determine if action is required to change the level of expenses. Some expenses can be charged to the RCC level. For example, equipment depreciation expense can be recorded at the RCC level. Analysis of this type of expense is also normally accomplished at the gross level, but if required, a lower level of analysis can be performed.

Suggested Improvements to the Costing Systems

The suggested improvements to the costing systems were analyzed not only as to whether the improvement makes sense, but also from a theoretical, practical, and/or DOD requirements viewpoint. No attempt was made to statistically determine the percentage of managers at different levels who were in favor of or against any given suggestion. If managers were opposed suggestions, the level of manager opposed and the reason for not supporting a suggestion will be discussed.

Timeliness of Data

The depot maintenance cost systems were originally developed for computers available in the early 1960s. They were all developed as batch-processing data systems which originally used punched card inputs. Since the memory capacity of early computer equipment was limited, the size of data systems was limited. As a result, AFLC Depot Maintenance evolved to 30+ data systems which required

multiple interfaces and an ordered processing of data systems to provide month end costing data. If there is a problem with the processing of any data system, those systems which follow in the processing order cannot be run. Under the optimum conditions (everything processes as designed) monthly financial data and the analysis of that data is often provided to managers too late for the manager to make timely decisions. This problem is especially critical in providing data to the ALC Director of Maintenance or to HQ AFLC. A project is in process to develop new depot maintenance data systems. AFLC will have to live with the timeliness problem until new systems are developed. Another timeliness problem occurs in the day to day input at the ALCs. Batch process inputs are used without feedback on input errors until an error listing is obtained the next day. Sometimes important data are not recorded in the proper period. The result is that management indicators, financial statements, and/or costing reports portray incorrect data which may cause an unnecessary explanation of variances. For example, a key element required to compute direct labor efficiency is the amount of work accomplished during the time period. If completed production is not recorded in the proper period, then the standard hours earned used in the labor efficiency computation is incorrect. Thus, a RCC may appear to be less efficient than it actually is, and the RCC managers

may be required to explain a level of efficiency which is understated. Conversely, the production turn-in which ends up in the following month may cause the efficiency to be overstated. In this case an inefficient RCC may not have to explain its inefficiency.

Actual Hour Accounting

An actual direct labor accounting system is required both from a theoretical job order accounting system perspective and also to be in compliance with DOD cost accounting requirements. The issue of whether depot maintenance cost systems need to have an actual hour system received a mixed reaction from the manager interviewed.

In general, managers from the product division chiefs through the DCS/Maintenance were in favor of actual hour accounting. For managers in the middle management and lower level management positions, it was a toss-up as to whether more managers favored actual hour accounting versus those who did not favor it.

The logic used to reject the concept was based on the premise that the benefits (if any) of actual hour accounting do not justify the problems with implementation of the procedure. Two specific concerns were cited with making a change. The first concerned obtaining accurate input without interfering with the production worker. The second concern was with whether the information would be

useful. Some managers felt that knowing the labor efficiency at the work center level was sufficient.

The reasons given for having an actual system include obtaining the capability to identify the actual labor expenses recorded against each job order. Some advantages of this data would be that if a work center recorded a low efficiency rate, then the actual job orders responsible for the low efficiency would be identified and any corrective actions and/or management attention would be directed towards those jobs. Another advantage of accurate job costs is that the quality of standards could be improved based on actual experience. This would not mean that engineered standards would go away, but that the history would provide backup information to help support standards. The data would also be useful in analyzing profit/loss information. With actual hour accounting, those jobs making or losing money could be accurately broken out by its cost elements, compared with the standards, and a determination of why the variance exists would be investigated.

Another advantage would be that the first level supervisor would have quantifiable information to judge the efficiency of the direct workers. Some supervisors argued that they already know which workers are efficient, but they might be surprised when the quantified information becomes available. The information could also be useful in

rating or disciplining employees. It could also help identify deficiencies in skills or the need for new or additional equipment.

Implementation of an actual hour system might not be the problem that some managers initially feel it will be. In several cases, the managers at the RCC level are already keeping manual records on actual hours. In addition with the newer computer capabilities for data input, a system could be implemented using bar code readers or some other input method. Two specific workloads for which the process could be easily implemented would be aircraft and engines. The engine division at Tinker AFB is in the process of implementing a parts status system which could easily be modified to include actual direct labor hours used in repair. The aircraft workload uses a card system which identifies to the worker each task to be performed. When an employee finishes a task, then a new card is obtained. At this point, it would be simple to collect the hours spent on the previous task.

Direct Material Costs

The policies and procedures for direct material charges are in compliance with DOD and theoretical job order costing requirements. However, there is a problem with the actual implementation of the procedures. The problem is that material is charged to the wrong job orders. This condition was noted by every level of management who were

interviewed. Inaccurate material charges negate efforts to perform meaningful analysis of direct material expenses. Another problem caused by incorrect charges concerns the building of bills of material. Unlike a manufacturing activity, where it is easy to predict the material required to perform a manufacturing process, a repair process must use an average replacement factor in the bill of material. If the material usage history on a job order is inaccurate, then the bill of materials will be incorrect. An erroneous bill of material causes sales rates to be incorrect and also provides an incorrect projection of material requirements.

The primary reason for incorrect material charges is caused by a tendency for mechanics to remember certain job order numbers. If a given number works for obtaining material, then mechanics will use the number even though it is not the job being worked. Another procedure which can lead to incorrect charges is the obtaining of all material required to accomplish a job order even though all the reparable carcasses are not on hand. Then if the total number of reparables does not generate, the unused material is not always turned in against the job order, but is used on another job order. The first job ends up with overcharges, while the second job is undercharged

The current operations allow the situation to continue because of two primary reasons. There is a general lack of

supply discipline. Often the general emphasis at the RCC level is on production and not the proper matching of resources with the job that consumes the resources. Another problem is caused by the lack of data system edits to prevent the issue of material in excess of potential use. In some production units, manual efforts are used to preclude the overcharging of direct material to the wrong job order. This method is the only practical solution to the problem until data systems can be developed with edits to prevent over/under charging of material.

Rework Costs

The implementation of the current costing systems does not presently provide any data on the cost of rework. This was not viewed as a problem at the medium and lower levels of management within the product divisions. These managers felt that they had enough information on rework. Managers in the quality assurance functional area, upper level ALC managers, and HQ AFLC managers would like to see rework costs collected. The data systems and operating procedures are established to collect rework costs. The basic problem with collection of the data is caused by a feeling that the only use for rework information is as a black mark against the RCC with too much rework.

Upper level management and quality personnel would like to have the information so that they can identify problems with employee skills, tools, equipment, material, and/or

the repair process. They believe rework data will serve as a tool to improve the effective use of maintenance resources.

An education program needs to be implemented to convince the RCC employees that rework will not be used to rate the RCC, but only as a tool to improve the repair capabilities. If actual hour accounting were implemented in depot maintenance, then excess time charged to a given job order would provide indications that rework was being performed. In any case, if too many hours are charged to a job, the reason for the excess hours needs to be determined. Some of the reasons could develop into the recording of rework information. Improvements in direct material charges would have a similar impact. Research of material usage variances could identify rework costs.

Equipment Repair and Maintenance Costs

The current costing system does not provide detailed information on the cost of repair and maintenance of depot maintenance production equipment. This information would be useful in identifying equipment which might be considered for replacement or overhaul. There are several problems with the collection of equipment cost data. First, all equipment repair/maintenance costs are not identified as such. Each ALC has a service organization which performs internal maintenance and repair of equipment. The resources consumed by these actions are

recorded simply as indirect material and indirect labor in the accounting system. Another problem concerns the level of detail that contracted equipment repair and maintenance are recorded in the cost systems. Most contracted expenses are not even recorded down to the RCC level, much less down to the equipment level.

The equipment managers within depot maintenance would be able to use the equipment cost information for several different purposes. It would be useful to know what the total equipment costs were for individual equipment assets. This information would help in making decisions on replacement and/or overhaul. It would also be useful to have data which prove that new equipment provides a cost benefit over old equipment. Economic analyses are performed for new equipment buys, but actual, after the fact, total costs of operation would help to prove that the new equipment does save money.

Standard Cost System

Several managers interviewed expressed interest in a cost system which would provide profit/loss information by individual job orders. A standard cost system would provide the capability to provide a "should cost versus the actual cost of the job order. Then the variances between actual and standard costs could be analyzed. A standard system will not work unless accurate standards and actual cost information is available. In order to implement a

standard system, the existing policy for recording all costs as product costs would need to be revised to be consistent with theoretical job order costing procedures. Only costs which are direct or production overhead costs should be charged to the job order.

Summary

This chapter has provided a comparison of the current depot maintenance costing system with both the DOD requirements and the theoretical requirements for a cost system. It has also provided an analysis of depot maintenance managers suggestions for improvements and/or problems with the current system. Chapter V will present an overall analysis of the costing systems, provide some recommendations for improving the systems, and provide recommendations for further research.

V. Conclusions and Recommendations

The current cost accounting system works. Most of the managers interviewed for this study were pleased with the overall information available. The managers were very flexible in obtaining the information that the system did not provide. They worked around the system to obtain the information. The area of greatest concern is that accurate charges of costs are not available at the job order level. Costs can be controlled and managed at higher levels, but not at the job order level. The two areas of most concern are the recording of labor and materials expenses.

The depot system has a sophisticated labor accounting system. The problem with the system is that labor costs are only available down to the RCC level. In order to obtain costs for job orders, an allocation is made based on the standard hours for the job orders and the actual direct labor hours used in the RCC. This accounting procedure also impacts the production overhead and G&A expenses assigned to jobs because their allocations are based in some manner on the direct labor costs. The labor system does provide managers with a large amount of information on the consumption of labor. Reports are available which provide a breakout of labor by almost every category of indirect labor that the managers need.

The material cost systems and procedures are in general agreement with the proper costing information required by the depot maintenance managers. The problem is with the accuracy of the data. The data provided does not accurately present the direct material costs at the job order level. Unless manual procedures are used, the material cost systems allow material costs to be charged which are in excess of any possible use of material on the job. Conversely, material overcharged on a given job will cause undercharges on other jobs. Material can be managed at a higher level than the job order, but for management of the costs on job orders, the information is not accurate.

Recommendations to Improve Cost Information

The areas for improvement to the current costing system will require a combination of management policy changes, procedural changes, and/or data system changes. Most of the changes will be impossible to implement until the appropriate data systems can be revised. The following areas of improvement should be considered as AFLC modernizes its data systems.

Timeliness of Information

There are several areas in which changes in data systems design and/or processing of information could improve the timeliness of information available for management use. Improvements could be achieved through a reduction in the number of data systems, a real time data

input feedback capability, and more real time information - including non-paper access to information and report formulating capabilities. A discussion of each area follows.

A significant problem in obtaining timely information is caused by the complicated system interfaces which are the result of processing over thirty data systems. The month end processing of information requires that each data system must be run in the proper order to ensure that the proper interface of data is processed. As new management information systems are designed, a consolidation of the data systems should be accomplished. The subsequent reduction in interfaces and dependencies on other systems should reduce the time to process information.

Real time feedback on data input will result in less batch processing techniques. Batch processing requires that daily transaction listings and error reports must be reviewed to ensure that data was accurately input into the system. The problem with the current system is that data input corrections do not occur until some period in the future. This means that systems which use daily reports will contain erroneous data. A system which provides immediate feedback on input errors and allows immediate correction will improve the timeliness of data inputs. This information will then be available for the manager in a more timely manner.

The modern manager needs to have a capability to receive management information in a real time access mode. This requires that the management information design will allow access to data either through remote printers or monitors. The information does not have to be real time information, but the capability needs to exist to access the information during normal duty times. In addition to access, the manager needs to be able to obtain the information in any format that is required. Implementation of this capability can be achieved through use of data base management systems with remote printers and/or monitors.

Actual Hour Accounting

Implementation of an actual direct labor accounting system will allow the depot maintenance cost system to be in compliance with DOD requirements and will enhance the managers information on job order costs. As long as the level of detail required for costing is at the RCC level, then current costing systems are satisfactory. However, there is much to be gained from knowing actual costs at the job order level. The job order costing information will be useful in determining which job orders need to be analyzed when costs exceed standards. Analysis of the job order(s) exceeding standards should focus management attention on problems which need correction. An actual hour system will require data system changes before it can be implemented. It should be a high priority item for implementation under

the current management information system modernization effort.

Direct Material Costs

Depot maintenance needs a material costing system which includes system edits to prevent the overcharging of material cost to job orders. A system change which highlights a potential overcharge at the time material is requested would help. The system could have several different levels of edits. For example, it might require a different level of management review/approval as the amount of material requested exceeds the normal repair requirements. The system could collect information on why a particular job order requires more material than normal. For example, information could be collected on the quality of material, rework costs, or reparable assets in unusual poor condition. Management could review this information to determine if action is required to improve the situation. Also, more accurate material usage information will improve the quality of the bill of materials and also the quality of the material portion of sales rates.

Rework Costs

Rework cost information could be improved simply through emphasis by higher management on the collection of the data. Managers in the product division must be told that the information will be used to identify problems and not as a management indicator for criticism of the RCC

manager. Additional capability on collecting rework costs can be achieved through data system improvements of the labor and material costing systems. An actual hour labor system would identify to the specific job when labor is being expended for rework. The same sort of information could be obtained for material rework costs if the material system is improved.

Rework information should allow depot maintenance to decrease the cost, improve the quality, and reduce the time of repair. Rework efforts beyond a certain level could identify problems in processes, skills, material, equipment, and/or facilities. Once a problem is identified, then management attention would be directed towards improving the situation.

Equipment Operation Costs

An improvement in the detailed costs of equipment operations would aid equipment managers in decisions for replacement, major overhaul, and providing information on the actual cost reductions of new equipment. This information requirement would not significantly change the job order costing system, though some improvement of spreading costs would cause those jobs which are equipment intensive to have a higher cost if equipment costs were more equitably distributed. For example, some equipment repair costs are recorded as G&A expenses which are shared by all products. If the costs were recorded as production

overhead, then not only would it be easier to determine the costs of individual equipment, but it would result in more equitable costing of individual job orders. The primary advantage of a more detailed system, however, would be the additional information provided to the equipment managers which would aid their decisions on replacement of equipment.

Recommendations for Further Study

Several recommendations have been made to improve the depot maintenance cost accounting system as a result of this study. Additional research could be performed to analyze the benefits and implementation of cost systems other than a job order system and also on variations of the current job order system. Some alternative costs systems for review include a process costing system, a direct cost system, a standard job order system, and a standard process system. The research effort would need to perform a detailed analysis of how depot maintenance managers might benefit from one of the other cost systems and also for which workloads a different system might have some benefits. The research effort would not have to limit itself to just one alternative system, but could look at all alternatives. The final recommendation might include a combination of different systems.

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Block 19. Abstract

The purpose of this study was to analyze the Air Force Logistics Command Depot Maintenance cost accounting systems from the viewpoint of information provided to managers. The three basic objectives of the study were: (1) Determine how the costing system treated material, labor, and overhead expenses. (2) Identify the cost information the managers had available to aid their decision process. (3) Identify changes to the cost systems which would provide the managers improved information.

The study reviewed the cost accounting system from three perspectives: the Department of Defense cost requirements, the theoretical cost systems, and the managers viewpoint. The current cost system was analyzed from each of these perspectives.

Recommendations are provided to improve the current cost systems. The study recommends that the following areas of improvement will provide information which will aid the manager in the decision making process. (1) Improve the timeliness of providing information. (2) Develop an actual hour accounting system. (3) Improve the accuracy of direct material charges. (4) Provide management with rework costs. (5) Provide detailed information on equipment repair and maintenance costs. (6) Use a standard cost system.

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